

# JAGUAR



MINING INC.

**ANNUAL INFORMATION FORM**

**FOR THE YEAR ENDED DECEMBER 31, 2016**

**Dated March 30, 2017**

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## CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Information Form (“AIF”) contains forward-looking statements and information within the meaning of applicable Canadian securities legislation (collectively, “forward-looking statements”). These forward-looking statements relate to, among other things, the objectives, goals, strategies, beliefs, intentions, plans, estimates and outlook of Jaguar Mining Inc. (“Jaguar” or the “Company”).

Forward-looking statements can generally be identified by the use of words such as “believe”, “anticipate”, “expect”, “intend”, “plan”, “goal”, “will”, “may”, “target”, “potential” and other similar expressions. In addition, any statements that refer to expectations, projections or other characterizations of future events or circumstances are forward-looking statements. Forward-looking statements are based on estimates and assumptions made by Jaguar in light of its experience and perception of historical trends, current conditions and expected future developments, as well as other factors Jaguar believes are appropriate in the circumstances. These estimates and assumptions are inherently subject to significant business, economic, competitive and other uncertainties and contingencies, many of which, with respect to future events, are subject to change. Although Jaguar believes that the expectations reflected in such forward-looking statements are reasonable, undue reliance should not be placed on such statements.

In making the forward-looking statements in this Annual Information Form, Jaguar has made several assumptions, including, but not limited to assumptions concerning: production costs; the geological interpretation and statistical inferences or assumptions drawn from drilling and sampling analysis that are involved in the calculation of Mineral Reserves and Mineral Resources; that there is no material deterioration in general business and economic conditions; that there is no unanticipated fluctuation of interest rates and foreign currency exchange rates; that the supply and demand for, deliveries of, and the level and volatility of prices of gold as well as oil and petroleum products develop as expected; that Jaguar receives regulatory and governmental approvals for its development projects and other operations on a timely basis; that Jaguar is able to obtain financing for its development projects on reasonable terms; that there is no unforeseen deterioration in Jaguar’s costs of production or Jaguar’s production and productivity levels; that Jaguar is able to procure mining equipment and operating supplies in sufficient quantities and on a timely basis; that engineering and construction timetables and capital costs for Jaguar’s development and expansion projects are not incorrectly estimated or affected by unforeseen circumstances; that costs of closure of various operations are accurately estimated; that unforeseen changes to the political stability or government regulation in the country in which Jaguar operates do not occur; that there are no unanticipated changes to market competition, that Jaguar’s mineral reserve estimates are within reasonable bounds of accuracy (including with respect to size, grade and recoverability) and that the geological, operational and price assumptions on which these are based are reasonable; that Jaguar realizes expected premiums over London Metal Exchange cash and other benchmark prices; and that Jaguar maintains its ongoing relations with its employees, affected communities, business partners and joint venturers.

Actual results may differ materially from those expressed or implied in the forward-looking statements contained in this Annual Information Form. The Company anticipates that subsequent events and developments may cause the Company’s views to change. Factors which could cause results or events to differ from current expectations include, among other things: Jaguar’s ability to maintain a listing of its common shares on a stock exchange; actions taken by the Company’s lenders, creditors, shareholders, and other stakeholders to enforce their rights; actions taken against the Company by governmental agencies and securities and other regulators; and other factors not currently viewed as material that could cause actual results to differ materially from those described in the forward-looking statements. Important factors that could cause actual results to differ materially from these expectations are discussed in greater detail under the heading “*Risk Factors*” in this Annual Information Form. When relying on forward-looking statements to make decisions with respect to Jaguar, carefully consider these risk factors and other uncertainties and potential events. Jaguar undertakes no obligation to update or revise any forward-looking statement, except as required by law.

## REPORTING CURRENCY

In this Annual Information Form, unless otherwise stated, dollar amounts are reported in US dollars.

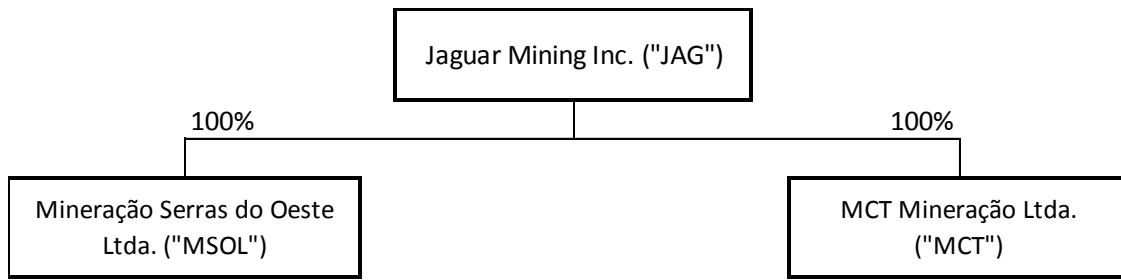
## CORPORATE STRUCTURE

Jaguar Mining Inc. (“Jaguar” or the “Company”) was incorporated on March 1, 2002 pursuant to the *Business Corporations Act* (New Brunswick). On March 30, 2002, Jaguar issued initial common shares to Brazilian Resources, Inc. (“Brazilian”) and IMS Empreendimentos Ltda. (“IMS”) in exchange for property. In that transaction, Brazilian contributed to Jaguar all of the issued and outstanding shares in Mineração Serras do Oeste Ltda. (“MSOL”), a Brazilian mining company that controlled the mineral rights, concessions and licenses to certain property located near the community of Sabará, east of Belo Horizonte in the state of Minas Gerais, Brazil (the “Sabará Property”), and IMS contributed to Jaguar a 1,000-tonne per day production facility also located east of Belo Horizonte near the community of Caeté and the mineral rights to a nearby property related to National Department of Mineral Production (“DNPM”) Mineral Exploration Request no. 831.264/87 and DNPM Mineral Exploration Request nos. 830.590/83 and 830.592/83 (the “Rio de Peixe Property”). Jaguar was continued into Ontario in October 2003 pursuant to the *Business Corporations Act* (Ontario) and is a corporation existing under the laws of Ontario.

On October 9, 2003, pursuant to an amalgamation agreement dated July 16, 2003, Jaguar amalgamated with Rainbow Gold Ltd. (“Rainbow”), a New Brunswick corporation and a then inactive reporting issuer listed on the TSX Venture Exchange (the “TSX-V”), through a reverse take-over. The amalgamated entity adopted the name “Jaguar Mining Inc.” Jaguar was approved for listing on the TSX-V on October 14, 2003 and began trading on October 16, 2003. Jaguar subsequently graduated from the TSX-V to the Toronto Stock Exchange (the “TSX”) and began trading on the TSX on February 17, 2004 under the symbol “JAG”. On July 23, 2007, trading of Jaguar’s common shares commenced on the NYSE Arca Exchange (“NYSE Arca”) under the symbol “JAG”. In July 2009, Jaguar received approval from the New York Stock Exchange (“NYSE”) to transfer the trading of its common shares from the NYSE Arca to the NYSE. Trading on the NYSE began on July 6, 2009, also under the symbol “JAG”. The common shares of the Company were delisted from the NYSE on June 7, 2013 and from the TSX on April 30, 2014, when the Company announced that the TSX-V had accepted its listing application. On July 29, 2016, the common shares of Jaguar and the Company’s outstanding convertible senior secured debentures (“Debentures”) were approved for listing on the TSX. The common shares and Debentures commenced trading on the TSX on August 3, 2016 and the common shares of Jaguar were simultaneously de-listed from the TSX-V. See *“General Development of the Business – Recent History – New York Stock Exchange Delisting, Toronto Stock Exchange Delisting, Listing on the Toronto Stock Venture Exchange, Termination of Registration with the SEC and Graduation to the Toronto Stock Exchange”*.

As at December 31, 2016, Jaguar had three wholly-owned direct subsidiaries, Mineração Serras do Oeste Ltda. (“MSOL”), Mineração Turmalina Ltda. (“MTL”) and MCT Mineração Ltda. (“MCT”), each incorporated under the laws of the Federal Republic of Brazil (“Brazil”). In Q1 2017, MSOL completed a merger with MTL to centralize the assets and businesses into a single company, MSOL, providing greater efficiency and effectiveness in asset management as well as greater synergy and significant reduction of operating costs. The registered and head office of each of MSOL and MCT is located at Rua Levindo Lopes 323, Funcionários, Belo Horizonte, Minas Gerais, CEP 30140-170, Brazil. Jaguar’s registered office is located at 100 King Street West, 56<sup>th</sup> Floor, Toronto, Ontario, Canada, M5X 1C9.

Jaguar Mining Inc. – Corporate Structure Chart (as at March 30, 2017)



**GENERAL DEVELOPMENT OF THE BUSINESS**

**Overview of Business**

Jaguar Mining Inc. is engaged in the acquisition, exploration, development and operation of gold producing properties in Brazil. The Company holds mineral concessions comprising 25,000 hectares in the Iron Quadrangle mining district of Brazil, a prolific greenstone belt located near the city of Belo Horizonte in the State of Minas Gerais, where the Company's current operating mines are located. In addition, Jaguar holds mineral concessions totaling more than 131,000 hectares in the State of Maranhão, where the Company's Gurupi Project is located and approximately 35,000 hectares in the State of Ceará, where the Company's Pedra Branca Project is located. The Company may consider the acquisition, exploration, development and operation of other gold properties.

The Company currently produces gold at its Turmalina and Caeté operations, while the Company's Paciência operation has been on care and maintenance since 2012. Turmalina, Caeté, and Gurupi are material properties of Jaguar.

Potential for a significant increase in gold production exists through further exploration and development of the Company's existing brownfield land package around its existing mines and through the development of the Company's Gurupi Project, with potential for an open-pit gold mining operation.

The Company is led by a proven executive management team with extensive gold operations and development experience in South America.

**Recent History**

The following is a description of Jaguar's most significant events over the past three completed financial years.

*Turmalina Mining Complex – Geo-Mechanical Issues, Change in Mining Methods, Operational Review and Added Mineral Resources*

Gold production at Turmalina was 63,260 ounces in 2016, 50,659 ounces in 2015, and 47,968 ounces in 2014.

Underground development at the Turmalina mine totaled 5.6 kilometres in 2016, 3.6 kilometres in 2015, and 5.1 kilometres in 2014. During 2016, a total of 13.4 kilometres of underground delineation drilling and 4.2 kilometres of exploration drilling was conducted at the mine.

In 2015, certain operational improvement and cost reduction initiatives were put in place. These cost reduction initiatives include decreasing the length of development needed from the primary ramp to access ore, postponing the mining of low grade narrow ore bodies that may require additional development, and extraction of high-grade ore by the selective removal of pillars.

A specialized development contractor arrived on site in August 2015 to accelerate the mining of both the new Orebody C ramp to surface and to extend the Orebody A ramp to open up additional resources. In the fourth quarter of 2015, the development contractor completed the Orebody C ramp to surface. This reduced ore haulage distances and congestion in the top section of the ramp. At the end of Q2 2016, the Company ended the contractor's work after advancing the Orebody A ramp to reach Level 10, which is the bottom stoping level for 2017.

The previous mining design of stopes separated by rib pillars (developed prior to 2015) resulted in significant quantities of ore being left behind and not mined. Changes to access, primary and secondary development, and cemented backfill in primary stopes allows for full extraction below Level 8. Successful trials on surface have indicated the ability to backfill primary stopes with good quality cemented rockfill (CRF) exists. There were some concerns regarding fill rates with CRF underground, but a trial carried out in Level 9 of the mine showed that rapid fill rates could be achieved. The paste fill plan is currently being rebuilt to deliver a low solid paste (68% solids) that can be produced and distributed with only minor modifications to the existing system. This rebuilt paste fill plant is scheduled to be commissioned by the end of Q2 2017. Because of the need to avoid hauling development waste to surface, it is planned that CRF will be used to fill the bulk of the primary stopes with low-density paste for stopes immediately below the sill pillars.

On February 8, 2017, the Company announced multiple high-grade drill intercepts generated from 36 infill drill holes (5,393 metres) designed to test the current indicated and inferred mineral resource envelope of Orebody A and Orebody C at Turmalina. The drill intercepts completed confirm the continuation of high-grade gold mineralization down-plunge of Orebody A, and confirm the widening of the mineralization below current workings. Drill intercepts at Orebody C confirm a number of high-grade gold mineralized intercepts which suggests higher grade mineralization at depth, and could potentially increase mining production at Turmalina. The Turmalina drill program continues to increase the confidence in the geological model of both orebodies through increased drill density. Significant drill intercepts for Orebody A include 11.33 g/t Au over 17.1 metres (estimated true width ("ETW") – 14.6 metres), 9.95 g/t Au over 14.2 metres (ETW – 10.8 metres), and 6.08 g/t Au over 20.3 metres (ETW – 10.4 metres). Significant drill intercepts for Orebody C include 6.39 g/t Au over 6.1 metres (ETW – 6.0 metres), 9.27 g/t Au over 3.8 metres (ETW – 3.6 metres), and 7.04 g/t Au over 2.8 metres (ETW – 2.7 metres).

### *Processing*

Ore produced at the Turmalina mine is transported to the adjacent Carbon-In-Leach ("CIL") processing plant. The Turmalina plant consists of three ball mills, of which two were operating since January 2016 (Mills #1 and #2) at a capacity of 1,500 – 1,600 tonnes per day. During Q4 2016, the plant processed 122,000 tonnes at an average grade of 4.39 g/t compared to 100,000 tonnes at 4.79 g/t in Q4 2015. Overall, the processing plant maintained a recovery rate of 92.5% during Q4 2016, which is an improvement over the 91.3% recovery rate for Q4 2015. On January 5, 2017, the Company announced the successful recommissioning of Mill #3 with an estimated installed capacity of 1,600 tonnes per day. Using only Mill #3, Turmalina will be able to achieve the entire throughput of the plant with a lower operating cost, through electricity consumption savings, compared to using both Mills #1 and #2 in 2016. Mills #1 and #2 have been taken off-line for maintenance and will be kept on standby mode. The reconstruction of Mill #3 will allow the processing plant to be run at a full capacity of 2,000 tonnes per day or approximately 720,000 tonnes per year in future years using a combination of mills.

### *Mineral Reserves and Resources Update*

The majority of the diamond drilling in 2016 was programmed to upgrade the delineated resources in 2015 from Orebody A and Orebody C, as contemplated in the mine plan. In 2015 and 2016, the 25.6 kilometres and 17.9 kilometres, respectively, of infill and exploration drilling were successful to confirm the consistency in grade and tonnage of the mineralization along the targeted Orebody A - Levels 9 and 10, and Orebody C - Level 3.

The Company updated Mineral Resource and Mineral Reserve estimates based on the 2016 completed diamond drilling and development. The released estimates were carried out by the Jaguar geology team under the supervision

of Roscoe Postle and Associates Inc. (“RPA”). Cut-off grade was adjusted to reflect the changes in gold price and exchange rate to prepare the 2016 resource and reserve estimations. Mineral Resources at the Faina and Pontal deposits remain unchanged, as there is no new information for those areas.

Measured and Indicated Mineral Resources at Turmalina alone total 420,000 ounces of gold (2,737,000 tonnes grading 4.77 g/t Au) an increase of 30% compared to 2015 estimates mainly due to the infill drill hole results obtained at Levels 4 and 5 of Orebody C. Inferred Resources at Turmalina total 118,000 ounces of gold (765,000 tonnes grading 4.81 g/t Au), a 50% decrease compared to 2015 estimates.

Turmalina Mine Mineral Reserves are 171,000 ounces of gold, close to that reported as at December 31, 2015, while average grade declined 12% to 4.69 g/t Au. Orebody C Mineral Reserves increased 167% to 80,000 ounces of gold compared to 2015, following a decision to selectively mine higher-grade ore, having the net effect of lower tonnes. The total amount of incremental grade ore in the Mineral Reserves reduced from approximately 10% of the stopes in the 2015 model to 8.4% of the stopes in the 2016 model.

The geological drilling database cut-off date used to prepare the estimates was December 31, 2016. The database excludes drilling results obtained after December 31, 2016. Depletion from mine activity was considered through December 31, 2016.

#### Caeté Mining Complex – Production, Added Mineral Resources, Operational Review

The Caeté mining complex is composed of the Roça Grande and Pilar underground mines and a CIP processing plant (the “Caeté Plant”). The Pilar mine is located approximately 50 kilometres by road from the Caeté plant. Ore from the Pilar mine is hauled to the Caeté plant. The Caeté Plant was commissioned in June 2010 and commercial production was declared in October 2010.

During 2012, an operational review of the Caeté operation determined that operational overhead could be reduced and productivity improved without impacting long-term production capability. It was also determined to transition the operation to smaller ore and waste development headings, reduced stope dimensions and new ground control methodologies in order to improve head grade over historical results through reduced dilution. The new ground control methodology progressed well during 2015, and work is ongoing on the transition toward smaller heading. The changes were implemented in 2015 and are expected to reduce the cash operating cost per ounce and allow for increased and more predictable ounce production.

Based on the strong exploration drilling results and increased reserves and resources, primary and secondary development that had been suspended during Q4 2014 was resumed at Pilar during Q1 2016. A specialized development contractor arrived on site in March 2016 to accelerate the main ramp below Level 10 to open up additional resources. The contractor continues to assist with primary and secondary development at Pilar.

Pilar focused predominantly on infill drilling in 2016, trying to improve the percentage of ore mined from the measured category on a monthly basis. A hanging wall drift was started in Q3 2016 to create a drilling platform for deeper drilling of the orebodies. Surface drilling began at two brownfield geophysics anomalies, Pacheca and Cubas, near the Pilar mine. Drilling on the brownfield targets and deeper drilling of the main orebodies BA, BF, and BFII will continue through 2017.

The Roça Grande operations team continues to evaluate more effective methods to mine the 1.0 to 2.0 metre wide veins without excessive dilution, using a frontal-attack mechanized cut-and-fill mining method. A targeted exploration program has helped identify sufficient resources to continue mining to the end of 2017 and ore development has continued to allow mining to the end of 2017. Ore in Q1 2016 was generated primarily from ore development, but for the rest of 2016 stoping was the dominant ore source. Continued exploration drilling is now focused on proving up the potential resources being accessed by development and generating resources for 2018 and beyond. The exceptional exploration potential along strike and in the down-dip extension of related multiple

orebodies that have only open pits at present, justifies treating the Roça Grande operation as an “incremental ore” producer until the other orebodies can be brought into production.

Gold production at Caeté was 33,350 ounces in 2016, 39,762 ounces in 2015, and 44,089 ounces in 2014. Underground development at the Caeté mines totaled 4.6 kilometres in 2016, 0.23 kilometres in 2015, and 5.0 kilometres in 2014. During 2016, a total of 15.0 kilometres and 5.3 kilometres of underground delineation drilling and exploration drilling, respectively, was performed at the Pilar and Roça Grande mines.

At current mining grades, transportation costs from the Pilar mine to Caeté Plant account for approximately \$150-200 per ounce. This is a significant cost and sustainable improvement in grades mined is required in order to make Pilar economically viable at current gold prices. Pilar currently accounts for more than 76% of the ore processed at the Caeté plant. The past financial position of the Company resulted in a lack of exploration ahead of operations. This situation will continue to result in lower than desired ore grade and higher production costs, until the resources discovered from the 2015 Pilar exploration campaign are developed.

During 2016, the average head grade processed at Caeté improved compared to the prior year, primarily due to the discontinuation of mining ore below the marginal cut-off grade. Previously, significantly higher tonnage, including lower grade material, was fed to the plant which had a diluting effect on the grade and profitability. Additional improvement in grade at Pilar was achieved through modifying the shape of the sub-level open stopes to minimize the inclusion of waste at the edge of the plunging ore-shoots. Previous initiatives to reduce dilution from overbreak had proven successful and there were some gains from the update of the geological model.

The Roça Grande mining activity has historically focused on surface exposures of gold deposits, in the form of outcrops. These outcrops, mined using open-pit mining techniques have had limited exploration, focusing solely on down-dip projection of gold mineralization. The Roça Grande operations team continues to evaluate more effective methods to mine the 1.0 to 2.0 metre wide veins without excessive dilution, using a frontal-attack mechanised cut-and-fill mining method. The Company is currently undertaking exploration drilling to assess the merits of continuing Roça Grande’s mining operations and anticipates making a decision with regard to the future of Roça Grande in the second half of 2017.

Exploration drilling results released during 2015 indicate that Pilar has good continuity and grade below the present mining levels and has the potential to continue operations beyond 2017. Based on the strong exploration drilling results, primary and secondary development that was suspended during Q4 2014, resumed at Pilar during Q1 2016. This development has been carried out by the same contractor as at Turmalina. The mobilization of the contractor took place in January 2016.

#### *Processing*

During 2016, the Caeté plant achieved gold recovery of approximately 91% utilizing gravity, flotation, and Carbon-In-Leach (“CIL”) treatment of flotation concentrate. Optimization of the plant offers opportunities for both increased gold extraction and reduced unit processing costs. Various options are being explored and evaluated to better use the currently underutilized processing facility.

#### *Mineral Reserves and Resource Update - Pilar*

A new wireframe model is being completed to better reflect the geology and lithology at Pilar, which will improve the estimation process. This new modelling of the orebody has taken longer than originally expected. For the December 31, 2016 estimates, the 2015 block model was depleted of material mined in 2016 while work continues on the preparation of a new model.

The 11,136 metres of drilling carried out in 2016 will be included in a new model expected to be released at the end of Q2 2017.



Measured and Indicated Mineral Resources for the Pilar mine of 482,000 ounces of gold (3,315,000 tonnes grading 4.53 g/t Au) decreased 6% in 2016 compared to 514,000 ounces of gold (3,479,000 tonnes grading 4.591 g/t Au) due to depletion of the mined ore from resources. Inferred Resources for the Pilar mine total 212,000 ounces (1,207,000 tonnes grading 5.45 g/t Au).

Mineral Reserves of 142,000 ounces of gold (966,000 tonnes grading at 4.56 g/t Au) decreased 17% compared to 172,000 ounces of gold (1,220,000 tonnes grading at 4.39 g/t Au) due to depletion of the mined ore from the reserves.

Depletion from mine activity was considered through December 31, 2016.

#### *Mineral Reserves and Resource Update - Roça Grande*

At Roça Grande, the assessment of the available data geological models and resource estimations deposits included RG1, 2, 3, 6, and 7 deposits. As Roça Grande has no Mineral Reserves, the mine continues to operate as an “incremental ore” producer mining Resources.

At an assumed price of US\$1,400 per ounce, the Measured & Indicated Mineral Resources of the Roça Grande mine total 103,000 ounces (1,144,000 tonnes at an average grade of 2.80 g/t Au) and 1,759,000 tonnes at an average grade of 3.48 g/t Au of Inferred Resources totaling 197,000 ounces of gold. Estimates are based on the 2015 model, and depletion of 2016 mined ore from existing resources.

#### *Gurupi Earn-In Agreement with Avanco Resources Limited*

On October 4, 2016, Jaguar entered into an earn-in agreement (the “Avanco Agreement”) with Avanco Resources Limited (“Avanco”), pursuant to which Avanco may earn up to a 100% interest in Gurupi. Avanco is a Brazilian focused mining exploration and development company, targeting exploration and nearterm production from copper and gold projects. Avanco’s Board of Directors and Management team have extensive global resource industry experience, particularly in Northern Brazil where they have recently commissioned the Antas coppergold mine on-schedule and under budget. Avanco has offices in Perth, Australia; Rio de Janeiro; and Parauapebas, Brazil.

Upon the satisfactory completion of certain closing conditions, the Avanco Agreement provides Avanco with the right to earn 20% of Jaguar’s interest in Gurupi by paying to Jaguar an aggregate cash fee of \$1.7 million plus an additional fee of \$500,000 in cash or shares of Avanco, and by expending a minimum of \$300,000 on permitting and access in respect of Gurupi. Avanco will earn an additional 31% interest in Gurupi upon the publication of a JORC compliant reserve estimate in excess of 500,000 ounces, and will earn a further 29% interest in Gurupi upon demonstration of adequate funding coupled with the start of construction of a process plant with capacity in excess of 50,000 ounces per year. If Avanco cannot demonstrate adequate funding for Gurupi, Jaguar will have a one-time right to buy-back a 31% interest in Gurupi and control of Gurupi by paying to Avanco the reasonable costs and expenses incurred in the preparation of the JORC compliant reserve estimate and technical studies. Avanco will have the option to acquire the remaining 20% interest in Gurupi at any time by paying a fee equal to the greater of \$6.25 million or the sum of \$12.50 per ounce of gold as per the JORC compliant reserve estimate.

Pursuant to the Avanco Agreement, Jaguar will retain a Net Smelter Return (“NSR”) royalty (“Royalty”) upon the commissioning of production at Gurupi. The Royalty will be 1% NSR on the first 500,000 ounces of gold or gold ounce equivalents produced; 2% NSR on production from 500,001 to 1,500,000 ounces of gold or gold ounce equivalents; and 1% NSR on production exceeding 1,500,000 ounces of gold or gold ounce equivalents.

#### *Credit Agreement with Sprott Private Resource Lending (Collector) LP*

On November 7, 2016, Jaguar entered into a credit agreement (the “Sprott Credit Agreement”) with Sprott Private Resource Lending (Collector) LP (“Sprott Lending”), as lender, and MSOL and MTL as guarantors, whereby Sprott

Lending extended credit to the Company in the amount of \$10,000,000 (the “Sprott Facility”) on November 8, 2016. The Sprott Facility is payable over a term of 30 months, in equal monthly repayment, with an interest rate of 6.5% per annum, plus the greater of US dollar LIBOR or 1.25% per annum. In consideration for the structuring and syndication of the Sprott Facility, the Company made a cash payment to Sprott Lending for structuring and legal fees. In consideration for and providing the financing commitment, the Company issued an aggregate of 650,000 common shares of the Company to Sprott Lending and to Natural Resource Income Investing Limited Partnership.

Sprott Lending is an indirectly wholly-owned subsidiary of Sprott Inc., of which the Chairman is Mr. Eric Sprott. Mr. Sprott is a shareholder and held approximately 19% of the common shares as of November 8, 2016. The Agreement constitutes a “related party transaction” within the meaning of Multilateral Instrument 61-101 – Protection of Minority Security Holders in Special Transactions (“MI 61-101”). Because the value of the Facility and the consideration for the transaction is less than 25% of Jaguar’s market capitalization, the Company is exempt from the formal valuation and minority shareholder approval requirements of MI 61-101. The Board of Directors of the Corporation determined that the entering into of the Agreement was in the Corporation's best interests and unanimously approved the transaction. No special committee was established in connection with the transaction, and no materially contrary view or abstention was expressed or made by any director. The Company did not file a material change report more than 21 days before the entering into of the Credit Agreement as the details of the terms of the Facility, the Agreement and other supporting documentation were not settled until shortly prior to closing.

#### Convertible Senior Secured Debenture Offering

On October 27, 2015, the Company closed financing of the Convertible Senior Secured Debentures (the “Debentures”) at a price of \$1,000 per Debenture, for aggregate proceeds of \$21.5 million. The Debentures had a maturity date of October 27, 2018 and bore an interest rate of 12% per annum, payable in cash on a quarterly basis. The Debentures were convertible at the holder’s option into common shares of the Company, at a ratio of 8,781 common shares per \$1,000 of the principal amount (the “Conversion Ratio”). The Debentures were also redeemable after the completion of 12 months (October 28, 2016 or the “Call Date”), and prior to the maturity date, in cash in whole or in part. The redemption price was 120% of the principal amount of the Debentures outstanding within one year after the Call Date, and 110% thereafter, plus, in each case, any accrued and unpaid interest thereon.

The aggregate gross proceeds of \$21.5 million were used to repay Renvest for approximately \$8.4 million which transferred its interest in its credit facility and security interest with the Company to the lenders in the financing, which facility was amended and restated under the indenture governing the Debentures. The remainder of the net proceeds of the financing of approximately \$11.2 million was allocated to advance asset optimization plans in conjunction with the Company’s ongoing development and production activities, and for general corporate purposes.

As of October 5, 2016, 77.3% of the principal amount of the \$21.5 million Debentures had been converted into common shares of the Company at the Conversion Ratio. On October 5, 2016, the Company elected to redeem the remaining outstanding Debentures, in the principal amount of \$4,885,000, with such redemption to be effected on November 8, 2016. Notwithstanding the election to redeem the outstanding Debentures, holders of Debentures could elect to convert their Debentures into common shares at the Conversion Ratio at any time prior to close of business on November 7, 2016. Holders of the outstanding Debentures elected to convert their Debentures into common shares, resulting in 100% of the principal amount of the \$21.5 million Debentures converted into approximately 189 million common shares of the Company.

#### CCAA Proceedings

At the commencement of the CCAA Proceedings in December of 2013, Jaguar forecasted that it would face a liquidity crisis in the very near future and that additional liquidity would be required to preserve operations in a lower gold price environment. Despite its cost reduction efforts, Jaguar was not able to generate sufficient net revenues to

optimally fund its operations, or generate sufficient net revenues to service its substantial debts going forward. As of December 31, 2013, the Company had outstanding funded debt obligations of approximately US\$323 million in principal value. Jaguar incurred interest payments of approximately US\$13.7 million in 2013. On November 1, 2013, Jaguar deferred payment of approximately US\$3.7 million of interest on its \$165.0 million 4.5% Senior Unsecured Convertible Notes due November 1, 2014 (“4.5% Convertible Notes”) and the deferral eventually resulted in an event of default under the indenture governing such notes. Excluding the consideration of any events of default or acceleration obligations, Jaguar would be obligated to repay or refinance approximately US\$195 million in principal value of debt under the Credit Facility and the 4.5% Convertible Notes in the year ended December 31, 2014.

For the reasons outlined above, Jaguar concluded that additional restructuring efforts would be required to address Jaguar’s financial needs. Canaccord Genuity Corp. (“Canaccord Genuity”) was engaged as Jaguar’s financial advisor in May 2013 in connection with the design and implementation of a recapitalization strategy for Jaguar.

A review of potential alternatives showed that a comprehensive restructuring involving a debt to equity exchange and an investment of new money was the best available alternative to address Jaguar’s financial situation. The Board created a special committee (“SC2”) on October 30, 2013 to consider and advise the Board on strategic matters relating to Jaguar’s financial difficulties. The Board and SC2 determined that the completion of a recapitalization transaction offered substantial benefits to the Company and was in the best interests of the Company and its stakeholders. The Company concluded that it would be important to deleverage its balance sheet and to reduce the debt service payments that it must make to the extent possible in the circumstances.

On November 13, 2013, the Company and its subsidiaries entered into a support agreement (as amended, the “Support Agreement”) with holders (the “Noteholders”) of approximately 81% of its 4.5% Senior Convertible Notes and 82% of its \$103.5 million 5.5% Senior Unsecured Convertible Notes due March 31, 2016 (together with the 4.5% Convertible Notes, the “Notes”) to effect a recapitalization and financing transaction that would eliminate approximately \$268.5 million of the Company’s outstanding indebtedness by exchanging the Notes for common shares of Jaguar and injecting approximately \$50.0 million into the Company by way of a backstopped share offering (the “Share Offering”) by Noteholders pursuant to a backstop agreement dated November 13, 2013 (as amended, the “Backstop Agreement”) between the Company, its subsidiaries and certain Noteholders. Additional Noteholders signed consent agreements to the Support Agreement such that as of November 26, 2013, holders of approximately 93% of the Notes had signed the Support Agreement or a consent agreement thereto.

On December 23, 2013, the Company filed for creditor protection (the “CCAA Proceedings”) under the Companies’ Creditors Arrangement Act (Canada) (the “CCAA”) in the Ontario Superior Court of Justice (Commercial List) (the “Court”). The CCAA Proceedings were commenced in order to implement a recapitalization transaction as contemplated in the Support Agreement through a plan of compromise and arrangement (as amended, supplemented or restated from time to time, the “CCAA Plan”). The Court granted an Initial Order, Claims Procedure Order and Meeting Order, each dated December 23, 2013.

The Meeting of Affected Unsecured Creditors (as defined in the CCAA Plan) was held on January 31, 2014 and the CCAA Plan was approved by 100% of the Affected Unsecured Creditors that voted, in person or by proxy, at the Meeting. Following the Meeting, Jaguar obtained an order from the Court on February 6, 2014 sanctioning the CCAA Plan.

On April 22, 2014, the Company successfully implemented the CCAA Plan dated February 5, 2014. The CCAA Plan implemented a series of steps leading to an overall capital reorganization of Jaguar. These steps included, among other things:

- The common shares of the Company issued and outstanding immediately prior to the implementation of the CCAA Plan were consolidated at a ratio of one (1) post-consolidation common share for each 86.39636 pre-consolidation common shares (the “Consolidation”). Any fractional Common Shares resulting from the Consolidation

were rounded down to the next whole share without any additional compensation therefor. A total of 999,927 common shares were outstanding as a result of the consolidation.

- The Noteholders and certain other Affected Unsecured Creditors of the Company with proven claims received their pro-rata share of 14,000,000 common shares of the Company in exchange for their Notes and in satisfaction of their claims, respectively, and Noteholders who signed the Support Agreement, or a consent agreement thereto, as of November 26, 2013 received their pro rata share of an additional 5,000,000 common shares of the Company in exchange for their Notes. Pursuant to the CCAA Plan, the Notes (and the indentures under which such Notes were issued) have been irrevocably and finally cancelled and all unsecured claims of certain affected unsecured creditors of the Company are fully and finally released.
- Noteholders who participated in the Share Offering purchased up to their pro-rata share of 70,955,797 common shares of the Company (collectively, the "Offering Shares") and such Noteholders received their pro-rata share of 9,044,203 common shares of the Company (the "Accrued Interest Offering Shares") (based on the percentage that the unpaid interest on their Notes bore to the aggregate of all unpaid interest owing to all Noteholders who participated in the Share Offering as at December 31, 2013) in exchange for their Notes.
- Noteholders who backstopped the Share Offering pursuant to the Backstop Agreement purchased their pro-rata share (based on their backstop commitments) of the Offering Shares not subscribed for under the Share Offering and received their pro-rata share of an additional 11,111,111 common shares of the Company in exchange for their Notes.

Additional information about the CCAA Proceedings, including copies of all Court orders, are available at the website maintained by the Court-appointed monitor, FTI Consulting Canada Inc. (the "Monitor"), at <http://cfcanada.fticonsulting.com/jaguar> (which materials are not incorporated by reference herein).

#### Renvest Credit Facility

On December 17, 2012, Jaguar entered into a \$30 million standby credit facility (the "Renvest Credit Facility") with Renvest Mercantile Bancorp Inc. through its Global Resource Fund (the "Lender"). On January 25, 2013 (the "Closing Date"), Jaguar made an initial drawdown of \$5 million and on June 26, 2013, the Company finalized the drawdown of the remaining \$25.0 million under the Renvest Credit Facility.

Under the Renvest Credit Facility, interest was applied to the outstanding balance of all amounts drawn down from the Renvest Credit Facility at a fixed rate of eleven percent (11%) per annum, payable monthly in arrears. In addition, Jaguar agreed to pay the Lender a monthly standby fee in cash, equal to 0.2% of the undrawn balance of the Renvest Credit Facility, until the facility was terminated, fully drawn down or had expired. All drawdowns from the Renvest Credit Facility were fully due and payable 18 months following the Closing Date.

The proceeds from the Renvest Credit Facility were used for, among other things, working capital requirements related to the Turmalina, Caeté and Paciência mining properties.

In connection with the CCAA Plan, the Company negotiated amendments to certain terms of the Renvest Credit Facility. The Company paid a fee of \$1.0 million in connection with the amendments to the Renvest Credit Facility (\$0.6 million paid in cash and \$0.4 million payable as an increase in the principal amount of the Renvest Credit Facility). In connection with the amendments, the Company agreed to repay immediately to the Lender \$10.0 million on account of the outstanding obligations under the Facility. Also, the Lender waived its rights under the Facility to receive any portion of the net proceeds of the Share Offering, with the exception of the agreed upon \$10.0 million repayment described above.

By June 30, 2015, the balance on the Renvest Credit Facility was \$8.4 million. The Company was obligated to make a scheduled \$1.0 million principal payment on July 28, 2015, but this payment and other scheduled payments were

postponed pending closing of the Company's previously announced \$21.5 million private placement of the Debentures (the "Offering"). On October 27, 2015, the Company closed the Offering and \$8.4 million was paid to Renvest to transfer its interest in the Renvest Credit Facility to the investors in the Offering. For a full description of the Offering, please see *General Development of the Business – Recent History – Convertible Senior Secured Debenture Offering*.

*New York Stock Exchange Delisting, Toronto Stock Exchange Delisting, Listing on the Toronto Stock Venture Exchange, Termination of Registration with the SEC and Graduation to the Toronto Stock Exchange*

On December 3, 2012, Jaguar announced that the NYSE had notified the Company that the closing price of its common shares on the NYSE over the past 30 days was less than US\$1.00. Jaguar had a period of six months to bring its share price and 30 trading-day average share price back above US\$1.00. On June 3, 2013, NYSE Regulations, Inc. ("NYSE Regulation") commenced proceedings to delist the common shares of the Company from the NYSE and trading in the common shares was suspended prior to the opening on Friday, June 7, 2013. The Company did not appeal the NYSE Regulation staff's decision and the common shares of the Company were delisted from the NYSE on June 7, 2013.

Trading in the common shares of Jaguar on the TSX was suspended on December 23, 2013 as a result of the commencement of the CCAA Proceedings. On January 10, 2014, the Company received a letter from the TSX indicating that, as a result of the CCAA Proceedings, the common shares of the Company would be delisted effective at the close of market on February 10, 2014 and received conditional approval for listing its common shares on the TSX-V. On February 11, 2014, the TSX extended the scheduled delisting of the common shares of the Company to March 31, 2014 to allow the Company sufficient time to complete the transition of the listing of its common shares to the TSX-V. The common shares of the Company were delisted from the TSX on April 30, 2014, when the Company announced that TSX-V has accepted its listing application. Trading in the common shares of Jaguar at the TSX-V began on May 1, 2014.

In conjunction with the delisting of its common shares from the NYSE, on September 1, 2015, the Company applied to the United States Securities and Exchange Commission ("SEC") for the termination of the registration of the Company's common shares with the SEC and the suspension of all reporting obligations in the United States. Although the Company has remained a Canadian reporting issuer and all relevant documents continue to be available through the Company's website and through SEDAR, the Company's shareholders in the United States are no longer able to access documents filed by the Company by means of the SEC, NYSE or the EDGAR electronic reporting system.

On July 29, 2016, the common shares of Jaguar and the Company's outstanding convertible senior secured debentures ("Debentures") were approved for listing on the TSX. The common shares and Debentures commenced trading on the TSX on August 3, 2016 and the common shares of Jaguar were simultaneously de-listed from the TSX-V.

## **DESCRIPTION OF THE BUSINESS**

### **General**

Jaguar is a gold mining company engaged in gold production and in the acquisition, exploration, development and operation of gold mineral properties in Brazil.

Jaguar's operating mining complexes, Turmalina and Caeté, and the Paciência Mine Complex currently on care and maintenance are located in or adjacent to the Iron Quadrangle region of Brazil, a greenstone belt located east of the city of Belo Horizonte in the state of Minas Gerais. Jaguar's portfolio also includes the Gurupi Project in the state of Maranhão and the Pedra Branca Project in the state of Ceará.

Through its wholly-owned subsidiaries, MSOL, MTL and MCT, Jaguar has interests in, and controls the mineral rights, concessions and licenses to the mineral resources and mineral reserves presented under the section entitled “*Mineral Resources and Mineral Reserves*”.

All of Jaguar’s production facilities are, or will be, near Jaguar’s mineral concessions and are accessible via existing roads. Jaguar believes it has an advantage over other gold mine operators due to the clustered nature of its mineral resource concessions and the proximity of its concessions to its processing facilities and existing infrastructure.

### **Gold Production and Sales**

Gold production in 2016 totaled 96,608 ounces at a cash operating cost of \$719 per ounce sold, compared to 90,421 ounces at a cash operating cost of \$755 per ounce sold in 2015 and 92,057 ounces at a cash operating cost of \$980 per ounce sold during 2014.

Gold sales in 2016 totaled 97,277 ounces at an average price of \$1,239 per ounce compared to 92,988 ounces at an average price of \$1,145 per ounce in 2015, and 92,264 ounces sold at an average price of \$1,261 per ounce in 2014.

### **Competitive Conditions**

The gold exploration and mining business is an intensely competitive business. Jaguar competes with numerous companies and individuals in the search for, and the acquisition of, mineral licenses, permits and other mineral interests, as well as for the acquisition of equipment and the recruitment and retention of qualified personnel. There is also significant competition for the limited number of gold property acquisition opportunities. The ability of Jaguar to acquire gold mineral properties in the future will depend not only on its ability to develop its present properties, but also on its ability to select and acquire suitable producing properties or prospects for gold development or mineral exploration.

### **Employees**

As at December 31, 2016, Jaguar had 1,180 employees, 1,176 of whom are based in Brazil.

### **Foreign Operations**

All of Jaguar’s mineral projects are owned and operated through its wholly-owned Brazilian subsidiaries. Jaguar’s wholly-owned properties are located in the states of Minas Gerais, Maranhão and Ceará in Brazil. Jaguar is entirely dependent on its foreign operations for the exploration and development of gold properties and for production of gold.

### **Health, Safety, and Environmental**

Jaguar places high priority on the safety and welfare of its employees. We recognize that our employees are our most valuable asset. We have a code of conduct that is strictly enforced. While our accidents rate has reduced over the past few years, we strive for improving it further in future. We have an integrated management system in place that promotes open communication at all levels. Over the past few years, the health and safety team has expanded in order to meet compliance and regulatory requirements, and also to improve our operating standards. Our training program for new employees is extensive and includes the participation of experienced professionals that act as mentors, providing hands-on guidance and conducting periodical reviews.

During the year 2016, the Company had 7 Lost Time Incidents (“LTIs”). For each incident, management identifies the likely causes and develops remediation plans to prevent future recurrences. The overall LTI frequency rate is calculated as the number of lost-time injuries per million hours worked. All accidents are analyzed and the underlying

causes are identified to implement corrective actions. Proposed actions include the reinforcement of safe behavior with the Loss Prevention Program, thus aiming to strengthen the safety culture at Jaguar.

### **Technical Information**

The estimated Mineral Reserves and Mineral Resources for Jaguar's mines and mineral projects set forth in this Annual Information Form have been estimated in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Council – Definitions adopted by the CIM Council on May 10, 2014 (the "CIM Standards"). The following definitions are reproduced from the CIM Standards:

The term "*Mineral Resource*" means a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

The term "*Inferred Mineral Resource*" is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

The term "*Indicated Mineral Resources*" is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

The term "*Measured Mineral Resource*" is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

The term "*Mineral Reserve*" means the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

The term "*Probable Mineral Reserve*" means the economically mineable part of an Indicated and, in some circumstances, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

The term "*Proven Mineral Reserve*" means the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining,

processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

### **Mineral Resource and Mineral Reserve Estimates**

In March 2017, Jaguar completed the reconciliation of its Mineral Resources and Mineral Reserves. The reconciliation was prepared by the Company's technical services team under the supervision of Geraldo Santos, BSc Geo., MAIG (CP), Jaguar's Geology Manager. Mr. Santos is a Qualified Person in accordance with NI 43-101. Based on the reconciliation, as of December 31 2016, Jaguar's Mineral Resources are (i) Measured and Indicated Mineral resources of 150,504,000 tonnes with an average grade of 0.96 g/t Au containing 4,644,000 ounces of gold, and (ii) Inferred Mineral resources of 13,122,000 tonnes with an average grade of 2.54 g/t Au containing 1,073,000 ounces of gold. Jaguar's Proven and Probable Mineral Reserves, which are included in the Measured and Indicated Mineral Resource figure above, are 65,856,000 tonnes with an average grade of 1.25 g/t Au containing 2,641,000 ounces of gold. The tables below set forth Mineral Resource and Mineral Reserve estimates for the Turmalina and Caeté operations and the Gurupi Project as indicated in the Notes below.



Table 1: Summary of Mineral Reserves as at December 31, 2016

Table 1 - Summary of Mineral Reserves, December 31, 2016									
	Proven Reserves			Probable Reserves			Proven and Probable Reserves		
	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz	Tonnes	Grade	Gold oz
	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)	(000's)	(g/t)	(000's)
<b>Southern Brazil</b>									
<b>Turmalina Gold Complex</b>									
Ore Body A	330	5.86	62	196	4.66	29	526	5.41	91
Ore Body C	24	3.47	3	583	4.12	77	607	4.10	80
<b>Total - Turmalina</b>	<b>354</b>	<b>5.71</b>	<b>65</b>	<b>779</b>	<b>4.23</b>	<b>106</b>	<b>1,133</b>	<b>4.69</b>	<b>171</b>
<b>Caeté Gold Complex</b>									
<b>Pilar</b>									
Ore Body BA	11	2.31	1	-	-	-	11	2.13	1
Ore Body BF	11	2.66	1	293	4.57	43	304	4.48	44
Ore Body BFII	-	-	-	646	4.65	97	646	4.65	97
Ore Body LFW	5	2.83	-	-	-	-	5	2.83	-
Ore Body LPA	-	-	-	-	-	-	-	-	-
<b>Total - Pilar</b>	<b>27</b>	<b>2.47</b>	<b>2</b>	<b>939</b>	<b>4.62</b>	<b>140</b>	<b>966</b>	<b>4.56</b>	<b>142</b>
Roça Grande	-	-	-	-	-	-	-	-	-
<b>Total - Caeté</b>	<b>27</b>	<b>2.47</b>	<b>2</b>	<b>939</b>	<b>4.62</b>	<b>140</b>	<b>966</b>	<b>4.56</b>	<b>142</b>
<b>Total - Southern Brazil</b>	<b>381</b>	<b>5.47</b>	<b>67</b>	<b>1,718</b>	<b>4.45</b>	<b>246</b>	<b>2,099</b>	<b>4.64</b>	<b>313</b>
<b>Northern Brazil</b>									
<b>Gurupi Exploration Project<sup>6</sup></b>									
Cipoeiro	-	-	-	45,044	1.20	1,735	45,044	1.20	1,735
Chega Tudo	-	-	-	18,713	0.99	593	18,713	0.99	593
<b>Total - Northern Brazil</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>63,757</b>	<b>1.14</b>	<b>2,328</b>	<b>63,757</b>	<b>1.14</b>	<b>2,328</b>
<b>Total - Mineral Reserves</b>	<b>381</b>	<b>5.47</b>	<b>67</b>	<b>65,475</b>	<b>1.22</b>	<b>2,574</b>	<b>65,856</b>	<b>1.25</b>	<b>2,641</b>

Notes to Table 1:

1. CIM definitions are followed for Mineral Reserves.
2. Mineral Reserves at Turmalina were estimated at a break-even cut-off grade of 2.5 g/t Au. Some stopes were included using an incremental cut-off grade of 1.2 g/t Au. Mineral Reserves at Pilar are estimated at a cut-off grade of 1.90 g/t Au.
3. Mineral Reserves at Turmalina are estimated using an average long-term gold price of US\$1,250 per ounce, and a US\$/BRL\$ exchange rate of 3.49. Mineral Reserves at Pilar are estimated using an average long-term gold price of US\$1,150 and a US\$/BRL\$ exchange rate of 3.80.
4. A minimum mining width of 3 m was used for Turmalina and 2 m was used for Pilar.
5. Bulk density is 2.7 t/m<sup>3</sup> at Turmalina and 2.89 t/m<sup>3</sup> at Pilar in iron-formation poor domains and 3.05 t/m<sup>3</sup> in iron-formation rich domains.
6. Gurupi Reserves are based on the Technomine Feasibility Study Technical Report filed on SEDAR on January 31, 2011.
7. Number may not add due to rounding.

Table 2: Summary of Mineral Resources as at December 31, 2016

	Measured Resources			Indicated Resources			Measured & Indicated Resources			Inferred Resources		
	Tonnes (000's)	Grade (g/t)	Gold oz (000's)	Tonnes (000's)	Grade (g/t)	Gold oz (000's)	Tonnes (000's)	Grade (g/t)	Gold oz (000's)	Tonnes (000's)	Grade (g/t)	Gold oz (000's)
<b>Southern Brazil</b>												
<b>Turmalina Gold Complex</b>												
Ore Body A	928	6.51	194	235	5.39	41	1,163	6.28	235	226	3.59	26
Ore Body B	338	3.22	35	158	4.08	21	496	3.51	56	43	5.16	7
Ore Body C	164	3.19	17	914	3.80	112	1,078	3.72	129	496	5.34	85
Faina	72	7.39	17	189	6.66	42	261	6.87	58	1,542	7.26	360
Pontal	251	5.00	40	159	4.28	22	410	4.72	62	130	5.03	21
<b>Total - Turmalina</b>	<b>1,753</b>	<b>5.38</b>	<b>303</b>	<b>1,655</b>	<b>4.47</b>	<b>238</b>	<b>3,408</b>	<b>4.93</b>	<b>540</b>	<b>2,437</b>	<b>6.37</b>	<b>499</b>
<b>Caeté Gold Complex</b>												
<b>Pilar</b>												
Ore Body BA	264	4.08	35	168	5.29	29	432	4.55	63	65	5.13	11
Ore Body BF	217	4.32	30	749	4.73	114	966	4.64	144	293	6.77	64
Ore Body BFI	4	4.46	1	824	5.01	133	828	5.01	133	198	7.89	50
Ore Body C	80	4.24	11	371	4.73	56	450	4.64	67	140	5.10	23
Ore Body LFW	58	3.68	7	175	4.21	24	233	4.08	31	117	4.87	18
Ore Body LHW	-	-	-	12	3.61	1	12	3.61	1	5	3.11	1
Ore Body LPA	6	2.72	1	50	3.98	6	55	3.85	7	-	-	-
Ore Body SW	-	-	-	338	3.28	36	338	3.28	36	389	3.60	45
<b>Total - Pilar</b>	<b>628</b>	<b>4.14</b>	<b>84</b>	<b>2,687</b>	<b>4.62</b>	<b>399</b>	<b>3,315</b>	<b>4.53</b>	<b>482</b>	<b>1,207</b>	<b>5.45</b>	<b>212</b>
<b>Roça Grande</b>	<b>207</b>	<b>2.17</b>	<b>14</b>	<b>937</b>	<b>2.95</b>	<b>89</b>	<b>1,144</b>	<b>2.80</b>	<b>103</b>	<b>1,759</b>	<b>3.48</b>	<b>197</b>
<b>Total - Caeté</b>	<b>835</b>	<b>3.65</b>	<b>98</b>	<b>3,625</b>	<b>4.18</b>	<b>488</b>	<b>4,460</b>	<b>4.08</b>	<b>585</b>	<b>2,966</b>	<b>4.29</b>	<b>409</b>
<b>Total - Southern Brazil</b>	<b>2,588</b>	<b>4.82</b>	<b>401</b>	<b>5,280</b>	<b>4.27</b>	<b>726</b>	<b>7,868</b>	<b>4.45</b>	<b>1,125</b>	<b>5,403</b>	<b>5.23</b>	<b>908</b>
<b>Northern Brazil</b>												
<b>Gurupi Exploration Project<sup>2</sup></b>												
Cipoeiro	25,734	0.78	640	58,494	0.87	1,633	84,229	0.84	2,273	7,041	0.67	152
Chega Tudo	20,923	0.66	440	37,484	0.67	805	58,408	0.66	1,246	678	0.62	13
<b>Total - Northern Brazil</b>	<b>46,657</b>	<b>0.72</b>	<b>1,080</b>	<b>95,979</b>	<b>0.79</b>	<b>2,438</b>	<b>142,636</b>	<b>0.77</b>	<b>3,519</b>	<b>7,719</b>	<b>0.66</b>	<b>165</b>
<b>Total - Mineral Resources</b>	<b>49,245</b>	<b>0.94</b>	<b>1,481</b>	<b>101,259</b>	<b>0.97</b>	<b>3,164</b>	<b>150,504</b>	<b>0.96</b>	<b>4,644</b>	<b>13,122</b>	<b>2.54</b>	<b>1,073</b>

Notes to Table 2:

1. CIM definitions were followed for Mineral Resources.
2. Gurupi Resources were approved by Leah Mach (SRK) as Qualified Person, as disclosed in the press release dated July 30, 2012 filed on SEDAR.
3. Mineral Resources at the Turmalina Gold Complex include the Turmalina Mine, Faina deposit, and Pontal deposit. Mineral Resources at Caeté are estimated by depletion of the 2015 year-end block model with 2016 excavations.
4. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au at Turmalina, 3.8 g/t Au at Faina, and 2.9 g/t Au at Pontal. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au for the Roça Grande Mine and 1.93 g/t Au for the Pilar Mine.
5. Mineral Resources at the Turmalina Mine include all drill hole and channel sample data and mining excavations as of December 31, 2016.
6. Mineral Resources at the Faina and Pontal deposits remain unchanged from those stated as at December 31, 2015.
7. Mineral Resources are estimated using a long-term gold price of US\$1,500 for the Turmalina Mine and US\$1,400 per ounce for the Faina and Pontal deposits and the Caeté deposits.
8. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.49 Brazilian Reais: 1 US Dollar for Turmalina and 2.5 Brazilian Reais: 1 US Dollar for Faina and Pontal. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reais:1 US Dollar for the Caeté deposits.
9. A minimum mining width of approximately 2 m was used.
10. Bulk density is 2.83 t/m<sup>3</sup> for Orebody A and B and 2.97 t/m<sup>3</sup> for Orebody C at the Turmalina Mine.
11. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
12. Mineral Resources are inclusive of Mineral Reserves at Turmalina. No Mineral Reserves are currently present at the Roça Grande Mine. Mineral Resources are inclusive of Mineral Reserves for the Pilar Mine.
13. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
14. Numbers may not add due to rounding.

## Notes to Tables 1 and 2

Although Jaguar has carefully prepared and verified the Mineral Resource and Mineral Reserve figures presented herein, such figures are estimates, which are, in part, based on forward-looking information and no assurance can be given that the indicated amounts of gold will be produced. Estimated Mineral Reserves may have to be recalculated based on actual production experience. Market price fluctuations of gold as well as increased production costs or reduced recovery rates and other factors may render the present Proven and Probable Mineral Reserves unprofitable to develop at a particular site or sites for periods of time. See “Risk Factors” and “Cautionary Note Regarding Forward-Looking Statements”.

### *Mining Concessions and Environmental Licenses*

All of Jaguar’s mineral rights and mining concessions in connection with its operations in the state of Minas Gerais and mineral rights and exploration licenses in connection with its Gurupi and Pedra Branca projects located in the states of Maranhão and Ceará, respectively, are in good standing. Through its wholly-owned subsidiaries, Jaguar has all the necessary environmental licenses that are material to the operation of its mines and processing plants in Minas Gerais. At this time, Gurupi remains in a stalled process awaiting a solution to the suspension of the environmental license.

### **Material Mineral Properties**

Turmalina, Caeté, and Gurupi are material properties of Jaguar.

#### 1. Turmalina Mining Complex

The scientific and technical information contained in this AIF relating to the Company’s Turmalina Mining Complex is derived from the technical report titled “*Technical Report on the Turmalina Mine, Minas Gerais State, Brazil*”, filed on SEDAR on May 24, 2016, (the “Turmalina Technical Report”), and updated with results of the December 31, 2016 Mineral Resource and Mineral Reserve estimates. The Turmalina Technical Report was prepared by Jason Cox, P. Eng. and Reno Pressacco, P. Geo, both from RPA, each of whom is a “qualified person” as that term is defined in NI 43-101. Portions of the following information are based on assumptions, qualifications and procedures which are not fully described herein. Reference should be made to the full text of the Turmalina Technical Report.

#### *Property Description and Location*

The Turmalina Mine is located in the Conceição do Pará municipality in the state of Minas Gerais, approximately 120 kilometres northwest of Belo Horizonte and six kilometres south of Pitangui, the nearest important town.

The property comprises eight contiguous mineral rights concessions granted by the National Department of Mineral Production (DNPM) that cover an area of 4,996.17 ha. The mine is centred at approximately 19°44’36” south latitude and 44°52’36” west longitude.

The Turmalina Mining Complex consists of an underground mine and a carbon-in-pulp (“CIP”) processing plant (the “Turmalina Plant”). The Turmalina Plant was commissioned in November 2006 and commercial production was declared in August 2007. Turmalina has a 3,000 tonnes per day (“tpd”) CIP process facility with three lines of grinding mills, only one of which is operated to cater to current production volumes of 1200 tpd. Studies are underway to find opportunities to fill the unused capacity via brownfield exploration and remnant mining.

Jaguar has 100% ownership subject to a 5% net revenue interest up to \$10 million and 3% thereafter, to an unrelated third party. In addition, there is a 0.5% net revenue interest payable to the surface landowner.

### *Accessibility, Climate, Local Resources, Infrastructure and Physiography*

The Turmalina Mining Complex is accessed from Belo Horizonte by 120 kilometres of paved highways (BR-262 and MG-423) to the town of Pitangui. The Turmalina deposits are six kilometres south of Pitangui and less than one kilometre from highway MG-423.

Belo Horizonte is the commercial centre for Brazil's mining industries and has excellent infrastructure to support world-class mining operations. This mining region has historically produced significant quantities of gold and iron from open pit and large-scale underground mining operations operated by AngloGold, VALE, CSN, and Eldorado. The city is a well-developed urban metropolis of almost four million residents and has substantial infrastructure including two airports, an extensive network of paved highways, a fully developed and reliable power grid, and ready access to process and potable water.

Pitangui is a town of approximately 25,000 people. The local economy is based on agriculture, cattle breeding, and a small pig iron plant. Manpower, energy, and water are readily available.

The Turmalina mining complex lies approximately 700 MASL. The Pitangui area terrain is rugged in places, with numerous rolling hills incised by deep gullies along drainage channels. Farming and ranching activities are carried out in approximately 50% of the region.

The area experiences six months of warm dry weather (April to November) with the mean temperature slightly above 20° C, followed by six months of tropical rainfall. Annual precipitation ranges from 1,300 mm to 2,500 mm and is most intense in December and January. The climate is suitable for year-round operations.

Belo Horizonte is one of the world's mining capitals with a regional population in the range of 4 million people. Automobile manufacturing and mining services dominate the economy. General Electric has a major locomotive plant which produces engines for all of South America and Africa. Mining activities in Belo Horizonte and the surrounding area have been carried out in a relatively consistent manner for over 300 years. The Turmalina Mine site is within commuting distance of Belo Horizonte.

The Turmalina Mining Complex includes a nominal 2,000 tpd processing plant and tailings disposal area. Electrical power is obtained from the national grid.

All ancillary buildings are located near the mine entrance: gate house including a reception area and waiting room, administration building, maintenance shops, cafeteria, warehouse, change room, first aid, and compressor room. The explosives warehouse is located 1.2 km away from the mine area, in compliance with the regulations set forth by the Brazilian Army.

Other ancillary buildings are located near the processing plant and include an office building, a laboratory, warehousing, and a small maintenance shop.

There is no infrastructure related to the Faina and Pontal historic open pit operations.

### *History*

Gold was first discovered in the area in the 17th century, and through the 19th century, intermittent small-scale production took place from alluvial terraces and outcropping quartz veins. Gold production exploited alluvium or weathered material, including saprolite and saprolite-hosted quartz veins. Records from this historical period are few and incomplete.

AngloGold controlled the mineral rights from 1978 to 2004 through a number of Brazilian subsidiaries. AngloGold explored the Project area extensively between 1979 and 1988 using geochemistry, ground geophysics, and

trenching, which led to the discovery of the Turmalina, Satinoco (Orebody C), Faina, Pontal, and other mineralized zones. Exploration work at these mineralized bodies included 22 diamond drill holes totalling 5,439 m drilled from the surface to test the downward extension of the sulphide mineralized body. At the Satinoco target (Orebody C), a total of 1,523 m were completed in nine holes.

In 1992 and 1993, AngloGold mined 373,000 t of oxide ore from open pits at the Turmalina, Satinoco (now referred to as Orebody C), Pontal, and Faina zones. It recovered 35,500 oz of gold using heap leach technology. Subsequently, AngloGold drove a ramp beneath the pit and carried out drifting on two levels in the mineralized zone at approximately 50 m and 75 m below the pit floor to explore the downward extension of the sulphide mineralized body.

Jaguar acquired the AngloGold Turmalina properties in 2004 and continued operation of the underground mine. The mine is accessed from a 5 m by 5 m primary decline located in the footwall of the main deposit.

### *Geological Setting*

The Turmalina deposits are located in the western part of the Iron Quadrangle, which has been the largest and most important mineral province in Brazil for centuries until the early 1980s, when the Carajás mineral province, in the state of Pará, attained equal status. Many commodities are mined in the Iron Quadrangle, the most important being gold, iron, manganese, bauxite, imperial topaz, and limestone. The Iron Quadrangle was the principal region for the Brazilian hard rock gold mining until 1983 and accounted for about 40% of Brazil's total gold production. Gold was produced from numerous deposits, primarily in the northern and southeastern parts of the Iron Quadrangle, most hosted by Archean or Early Proterozoic-aged banded iron formations (BIF) contained within greenstone belt supracrustal sequences.

In the Brumal region, outcrops belonging to the granitic gneiss basement of the Nova Lima and Quebra sub-groups of the Rio das Velhas Supergroup occur. The granitic gneiss basement consists of leucocratic and homogeneous gneisses and migmatites, making up a complex of an initial tonalitic composition intruded by Archean rocks of granitic composition. The upper contact of the sequence is discordant and tectonically induced by reverse faulting. The Rio das Velhas is regionally represented by schists of the Nova Lima and meta-ultramafic rocks of the Quebra Group including serpentinites, talc schists, and metabasalts.

Iron formations occur as the only meta-sedimentary rocks in layers with thicknesses up to 10 m. The Nova Lima Group can be sub-divided into two units: a unit consisting of talc chlorites and intercalations of iron formation, fuschite schist, quartz sericite schist, and carbonaceous phyllite; and a unit hosting sulphidized gold bearing iron formation and quartz sericite schists.

The Pitangui area, where the Turmalina Mine is located, is underlain by rocks of Archaean and Proterozoic age. Archaean units include a granitic basement, overlain by the Pitangui Group, a sequence of ultramafic to intermediate volcanic flows and pyroclastics and associated sediments. The Turmalina deposit is hosted by chlorite-amphibole schist and biotite schist units within the Pitangui Group. A sequence of sheared, banded, sulphide iron formation and chert lies within the stratigraphic sequence. The stratigraphy locally strikes azimuth 135°.

Proterozoic units include the Minas Supergroup and the Bambui Group. The former includes basal quartzites and conglomerates as well as phyllites. Some phyllites, stratigraphically higher in the sequence, are hematitic. The Bambui is composed of calcareous sediments.

The local geology in the Turmalina and adjacent exploration areas was defined by AngloGold, specifically by UNIGEO geologists during the initial exploration field work. At that time, the mapped lithologies were defined and classified as a greenstone sequence, within a possible western extension of the Iron Quadrangle.

The stratigraphic column defined by UNIGEO in the region, from bottom to the top was:

- Basement

The basement is composed of foliated, leucocratic granite and gneisses. Locally, it has been defined as migmatite portions with porphyry crystals of quartz and K- feldspars. Granitic intrusions with fine to medium texture and diabase dikes are common.

- Pitangui Group

The Pitangui Group is defined as a greenstone belt sequence, of Archean age. It shows the following sequence:

- Meta-Ultramafic and Meta-Mafic Volcanic Unit (Basal Unit): constituted by interlayered igneous ultramafic and mafic flows represented by serpentinite, chlorite-actinolite schist and amphibolite with layers of talc schist, oxide BIF and carbonaceous schist;
- Meta-Mafic and Meta-Sediment Unit (Middle Unit): constituted by interlayered meta-mafic (chlorite-actinolite schist with dacitic intrusion at the top);
- Meta-sediment: cummingtonite BIF and metachert-rich horizons interlayered with carbonaceous and chlorite schist, locally, layers of meta-arkose can be observed);
- Meta-mafic: alternation of amphibolite and chlorite-actinolite layers;
- Pyroclastic and meta-pelites: volcanic meta-conglomerates at the bottom, transitioning to or alternating with foliated meta-lapilli tuffs and metatuffs at the top of the sequence, where the meta-tuffs are predominant;
- Meta-sediments (Upper Unit): narrow and numerous interlayered layers of quartz-sericite schist, quartz-chlorite schist, quartz-sericite-chlorite schist, and carbonate-rich schist.

- Minas Supergroup

The Minas Supergroup is defined as clastic and chemical sediments in a Proterozoic sequence composed by thin to coarse quartzites with layers of the basal conglomerates. The quartzite is covered by grey carbonate phyllites and white sericite phyllites which present hematite increasing to the top of the sequence.

- Intrusive Rocks

The intrusive rocks are defined as granitic and mafic to ultramafic rocks. The general stratigraphic sequence strikes towards azimuth 320° and dips moderately to steeply to the east. The sequence consists the Pitangui Group of bedded metasediments of volcanic origin including quartz-sericite schists and sericite-chlorite-biotite schists grading stratigraphically upwards into a metachert, banded iron formation (BIF) and graphitic schist. Overlying these sediments is a thicker sequence of tuffaceous metasediments and quartz-chlorite schists. All units have been metamorphosed to the amphibolite grade.

### *Exploration*

#### Geochemistry

AngloGold performed a regional geochemistry survey covering an area of 430 km<sup>2</sup> in the Turmalina region. A total of 875 stream sediments and 446 pan concentrate samples were collected. Stream sediment samples were assayed for Au, Cu, Zn, Pb, Cr, Sb, and As. Pan concentrate samples were assayed for Au only.

Soil geochemistry sampling was executed by AngloGold in both the Faina and Pontal areas with grids varying from 100 m x 20 m to 10 m x 10 m. At Faina, 1,272 soil samples were collected and 16,900 m of lines were opened. At Pontal, 1,698 soil samples were collected and 28,000 m of lines were opened.

Several samples returned gold grades superior to 300 ppb. A significant portion of the soil samples collected from these targets were also assayed for As and Sb. There is a strong relation between gold and As/Sb since gold is associated directly with quartz veins with arsenopyrite and/or berthierite in the region.

Initial exploration efforts by Jaguar in 2004 focused on the re-interpretation of the AngloGold data (trenches, soil geochemistry, and drilling) to better understand the local geology. These efforts were concentrated on the targets previously identified by AngloGold: Main, NE and Satinoco.

An exploration program was carried out at the Satinoco (Orebody C) target by Jaguar from March 2006 to April 2008 in order to collect sufficient information to prepare an estimate of the Mineral Resources in accordance with NI 43-101. This Satinoco (Orebody C) program included the opening of about 700 m of trenches and the collection of 146 channel samples crossing the mineralized zone and a complementary diamond drill program.

#### Geophysical Surveys

In the 1980s, AngloGold contracted the Instituto de Pesquisas Tecnológicas (IPT) to execute a ground geophysics survey at the Faina and Pontal areas. At Faina, a 50 m x 100 m grid was made composed of 11 lines covering about 31.5 ha. At Pontal, the grid was 40 m x 100 m, with 24 lines covering about 130 ha. Part of this area (approximately 56 ha) was surveyed by ground magnetics in a 5 m x 25 m grid.

Several geophysical anomalies were defined by both methods and most of them showed a strong relation with the geochemical anomalies. This information was used for the planning of trench locations.

In 2004, the Minas Gerais Government Mining Agency (COMIG) completed a supplementary airborne geophysical survey, covering all the Iron Quadrangle and the adjacent areas, totaling approximately 36,400 km<sup>2</sup>. This survey was performed by LASA SA on a 250 m grid using magnetic and gamma ray methods. All Jaguar targets, including the Turmalina Mine, were covered with these geophysical surveys.

#### *Drilling*

Following the trenching and channel sampling program between March 2006 and April 2008, Jaguar completed a three-phase drilling campaign in the Turmalina Mine area:

Phase 1: 5,501 m drilled in 35 holes. This program tested the continuity of the mineralized bodies between the weathered zone and up to 200 m below the surface.

Phase 2: 3,338 m drilled in 24 complementary in-fill holes to create a 25 m x 60 m grid between the surface and 100 m below and to test the lateral continuity of the mineralized bodies.

Phase 3: An additional drill hole campaign was carried out in 2007, which consisted of 12,763 m drilled in 48 holes. Results from holes FSN 10 to 68 from this campaign were included in the mineral resource estimate contained in the original TechnoMine technical report, dated October 22, 2007. Results from the remaining drill holes FSN 69 to 113 were included in the second TechnoMine technical report dated February 5, 2008.

During the three Satinoco/Orebody C drilling phases, 2,338 core samples from holes FSN 10 to 113 were collected. The drill program was carried out by Mata Nativa Comércio e Serviços Ltda. (Mata Nativa), a local drilling company, using Longyear drill machines.

Drill hole lengths ranged from 32 m to 453 m. Core diameters were consistently HQ from surface through the weathered rock to bedrock. At approximately three metres into bedrock, the holes were reduced to NQ diameter to the final depth.

Collar locations for the holes were established by theodolite surveys. All holes were drilled within three metres of the planned location. Azimuth and inclination for angle holes were set by Brunton compass, deemed accurate to within 2° azimuth and <1° inclination.

Following completion of the holes, the collars were resurveyed with theodolite and cement markers emplaced. Downhole surveys were completed in all holes with length greater than 100 m, using Sperry-Sun or Maxibore equipment.

The average core recovery was greater than 90%. Core samples were collected during these phases and sent to laboratories for gold assays (discussed in the next section).

Jaguar has continued to carry out drilling and channel sampling programs on the Orebodies. The drilling has been carried out from surface locations which provide general information as to the location of the mineralized zones. Further detailed drill hole information is gathered for the three Orebodies from underground locations. Final detailed information of the location and distribution of the gold mineralization is collected by means of channel sampling. A summary of the drilling and channel sample information that has been gathered as at June 30, 2015 is provided in Table 3.

Surface diamond drilling was carried out by the drilling contractor Mata Nativa using HQ and NQ tools. HQ-sized equipment is used for the portion of the hole that traverses the saprolite horizon and the hole diameter is then reduced to NQ when the fresh rock is reached. The diamond drill core procedures adopted by Jaguar are described below:

- Only drill holes with more than 90% core recovery from the mineralized zone were accepted.
- Drill hole deviations (surveys) were measured by Sperry-Sun or DDI/Maxibore equipment.
- The cores were stored in wooden boxes of one metre length with three metres of core per box (HQ diameter) or four metres of core per box (NQ diameter). The hole's number, depth, and location were identified in the boxes by an aluminum plate on the front of the box and by a water-resistant ink mark on its side. The progress interval and core recovery are identified inside the boxes by small wooden or aluminum plates.

The results of on-going drilling programs that targeted the immediate down-plunge areas of Orebody A were released in the fall 2014 and updated with the 2015 drill holes. It is to be noted that the intersection lengths represent core lengths and do not represent true thicknesses. The holes have been completed from drilling platforms located in the hanging wall of the mineralized zone and are designed to intersect the projected plunge and dip of the mineralization as closely as perpendicularly as possible.



**Table 3: In-fill and Extension Drilling Results, Orebody A  
Jaguar Mining Inc. – Turmalina Mine**

Hole ID	Year	From	To	Core Length (m)	Average Grade (g/t Au)
Intersections Within 2013 Mineral Resource					
FTS1022	2013	116.9	121.0	4.1	8.16
FTS1070	2013	75.0	90.0	15.0	12.60
FTS1072	2014	97.5	116.5	19.0	15.32
FTS1074	2014	111.7	127.5	15.8	9.09
FTS1081	2014	88.5	93.3	4.8	9.13
FTS1082	2014	100.0	103.7	3.7	13.71
FTS1083	2014	111.7	114.9	3.2	14.72
FTS1089	2014	122.3	138.5	16.2	9.32
FTS1108	2014	162.1	163.9	1.8	8.07
FTS1109	2014	116.4	130.7	14.3	6.36
Intersections Below 2013 Mineral Resource					
FTS1076	2014	141.2	151.5	10.3	9.99
FTS1088	2014	116.6	123.2	6.6	9.08
and		145.3	146.7	1.4	27.17
FTS1092	2014	153.7	161.6	7.9	8.36
FTS1097	2014	166.8	171.8	5.0	24.71
FTS1103	2014	165.0	169.6	4.6	13.21
FTS1104	2014	129.3	143.3	14.1	10.99
FTS1105	2014	141.6	143.3	1.7	16.78
Intersections Below 2014 Mineral Resource					
<u>FTS1171</u>	2015	152.4	158.1	5.7	7.44

FTS1173	2015	167.9	177.5	9.6	11.78
FTS1178	2015	166.0	178.3	12.3	6.44
FTS1179	2015	156.0	168.1	12.1	3.11
FTS1180	2015	163.9	174.1	10.2	3.72
FTS1199	2015	155.4	168.0	12.6	5.28
FTS1200	2015	198.1	211.7	13.5	7.54
FTS1203	2015	181.0	193.5	12.5	4.85
FTS1206	2015	207.4	221.9	14.6	8.58
FTS1211	2015	228.5	237.1	8.6	13.61
FTS1212	2015	229.3	237.9	8.6	23.38
FTS1217	2015	239.9	243.6	3.7	9.31
FTS1220	2015	84.8	102.7	17.9	4.53
FTS1222	2015	96.1	99.0	2.9	24.56
FTS1223	2015	75.7	84.2	8.5	6.58
FTS1224	2015	76.4	93.5	17.1	9.25
	and	126.3	128.2	2.0	26.35
FTS1235	2015	77.9	93.8	15.9	4.88
	and	139.7	141.5	1.8	21.52
FTS1238	2015	102.3	121.0	18.6	5.27
FTS1239	2015	95.9	112.2	16.3	6.23
FTS1249	2015	166.3	177.6	11.3	8.11
FTS1251	2015	208.8	216.4	7.6	16.19
FTS1253	2015	75.0	93.7	18.8	6.74
	and	128.7	130.6	1.9	24.01

SUMMARY OF SIGNIFICANT INTERSECTIONS, 2016 DRILLING PROGRAM, TURMALINA MINE

FTS1242	2016	85.2	99.4	14.3	8.71
	2016	130.5	135.2	4.7	10.39
FTS1256	2016	85.2	91.8	6.6	3.94
FTS1306	2016	130.5	152.8	22.3	6.08
FTS1307	2016	133.3	156.5	23.2	6.23
FTS1308	2016	105.9	109.6	3.6	2.07
FTS1311	2016	134.6	142.1	7.5	7.09
FTS1312A	2016	120.2	125.8	5.6	8.50
FTS1313	2016	123.0	125.8	2.8	1.77
FTS1314	2016	119.8	127.0	7.2	8.89
FTS1320	2016	38.5	46.0	7.5	3.33
	2016	61.2	69.9	8.7	5.08
	2016	91.8	94.7	2.9	16.54
FTS1321	2016	31.1	50.7	19.6	7.58
FTS1322	2016	48.7	57.2	8.4	2.65
FTS1323	2016	32.0	60.0	28.0	1.76
	2016	106.3	108.0	1.8	1.85
FTS1324	2016	35.8	52.9	17.1	11.33
FTS1325	2016	21.2	35.4	14.2	9.95
FTS1326	2016	134.5	151.1	16.6	2.89
	2016	147.3	151.1	3.8	9.27
FTS1327	2016	120.7	124.5	3.8	1.93
FTS1328	2016	146.6	154.6	8.1	7.05
FTS1331	2016	63.9	79.6	15.7	4.14
FTS1332	2016	86.9	95.5	8.6	4.32
FTS1333	2016	76.6	90.4	13.8	4.30
FTS1334	2016	56.3	101.2	44.9	4.04
FTS1335	2016	60.1	70.4	10.3	4.95
	2016	110.6	113.4	2.8	10.72
FTS1337	2016	145.0	153.7	8.7	0.88
FTS1338	2016	133.1	143.4	10.3	3.93
	2016	1331.0	135.9	2.8	7.04
FTS1339	2016	153.3	164.8	11.5	2.14
FTS1340	2016	136.7	157.5	20.9	1.61
FTS1341	2016	140.8	147.2	6.4	2.96
FTS1343	2016	148.9	154.6	5.7	0.87
FTS1344	2016	112.3	123.5	11.3	3.08

FTS1345	2016	83.3	87.9	4.6	1.62
FTS1346	2016	122.8	131.3	8.5	4.87
FTS1347	2016	111.0	117.3	6.3	1.94
FTS1355	2016	132.1	147.4	15.3	3.65
	2016	140.3	146.4	6.1	6.39
FTS1356	2016	124.8	140.1	15.4	2.26
FTS1357	2016	126.0	135.6	9.6	3.17

### *Sample Preparation, Analyses and Security*

#### Sampling

The sampling and sample preparation procedures used by Jaguar are as follows.

#### Surface/Exploration Channel Sampling

- Channel samples are regularly collected from outcrops and trenches.
- The sites to be sampled are cleaned with a hoe, exposing the material by scraping it.
- Structures are mapped and the lithologic contacts defined, and samples marked so that no sample has more than one lithology.
- Samples have a maximum length of one metre and are from one kilogram to two kilograms in weight.
- Each sample is collected manually in channels with average widths between five and ten centimetres, and about three centimetres deep, using a hammer and a chisel.
- Either an aluminum tray or a thick plastic canvas drop sheet is used to collect the material.
- The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are surveyed.

#### Diamond Drilling Core Sampling

- Surface drilling is performed by contractors with holes in HQ or NQ diameters.
- Underground drilling is performed either by Jaguar or contractors with holes in BQ and LTK diameters.
- Drill holes are accepted only if they have more than 85% of recovery from the mineralized zone.
- All the drill holes have their deviations measured by Maxibor or equivalent survey tool.
- The cores are stored in wooden boxes of one metre length with three metres of core per box (HQ diameter) or four metres of core per box (BQ or LTK diameters).
- The number, depth, and location of each hole are identified in the boxes by an aluminum plate or by a water-resistant ink mark in front of the box.
- The progress interval and core recovery are identified inside the boxes by small wooden plates.
- During logging, all of the geological information, progress, and recovery measures are verified and the significant intervals are defined for sampling.
- Samples are identified in the boxes by highlighting their side or by labels.
- Samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- One half of the sample is placed in a highly resistant plastic bag, identified by a label, and the other half is kept in the box at a warehouse.
- The remaining drill core from the surface-based drill holes is stored at an offsite secure location nearby to the mine.

- For many of the underground-based drill holes, samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- For the shorter-length, bazooka-type drill holes completed from underground set ups (the LM-series drill holes) the whole core is sampled as the core diameter does not permit splitting into halves.

#### Underground Production Channel Sampling

- The sector of wall to be sampled is cleaned with pressurized water. Structures are mapped and lithologic contacts defined, and samples marked so that no sample has more than one lithology. Samples have a maximum length of one metre and are from two to three kilograms in weight.
- Channel samples were taken by manually opening the channels, using a hammer and a little steel pointer crowned by carbide or a small jackhammer.
- The channel samples have lengths ranging from 50 cm to one metre, average widths between five and ten centimetres, and about three centimetres deep.
- Two sets of channel samples on the face are regularly collected. One set of channel samples are taken from the top of the muck pile once the work area has been secured. The second set of channel samples are taken at waist height once the heading has been mucked clean and secured.
- At roughly 5m intervals, the walls and back are sampled by channel sampling. The channel samples are collected starting at the floor level on one side and continue over the drift back to the floor on the opposite side.
- Either an aluminum tray or a thick plastic canvas is used to collect the material. The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are surveyed.

#### *Security of Samples - Sample Preparation and Analysis*

For surface-based exploration drill holes, samples are prepared at the SGS laboratories in Belo Horizonte. For other drill holes and channels, samples are prepared at Jaguar's mine site laboratories by drying, crushing to 90% minus 2 mm, quartering with a Jones splitter to produce a 250-g sample, and pulverizing to 95% minus 150 mesh. Analysis for gold is by standard fire assay procedures, using a 50 g or 30 g sample and an atomic absorption (AA) finish.

The SGS laboratory based in Belo Horizonte meets international analytical standards and ISO 17025 compliance protocols. Analytical results from the SGS laboratory were forwarded to Jaguar's Exploration or Mine Departments by e-mail, followed by a hard copy.

A process control laboratory at the Turmalina Mine analyzes the shift and plant samples, while all delineation drill core, channel, and exploration drill core samples from Turmalina are forwarded to the in-house laboratory located at the Caeté mine site.

At Jaguar's Caeté laboratory, the samples are dried and then crushed. A one kilogram sub-sample of the crushed material is selected for pulverization to approximately 70% minus 200 mesh. The ring-and-puck pulverizers are cleaned after each sample using compressed air and a polyester bristle brush. The analytical protocol for all samples employs a standard fire assay fusion using a standard 30 g aliquot, with the final gold content being determined by means of AA. The detection limit for fire assay analyses is 0.05 g/t Au. A second cut from the pulps is taken and re-assayed for those drill core samples where the grade is found to be greater than 30 g/t Au. If the two assays are in good agreement, only the first assay is reported. The AA unit is calibrated to directly read gold grades up to 3.3 g/t Au – samples with grades greater than this are re-assayed by diluting the solute until it falls within the direct-read range.

### *Quality Assurance and Quality Control*

The Caeté laboratory carries out an internal program of Quality Assurance/Quality Control (QA/QC) for all drill core samples. No QA/QC is performed for channel samples. The QA/QC protocol includes carrying out a duplicate analysis after every 20 samples, representing an insertion frequency of 5%.

Commercially sourced standard reference materials (Rocklab standards Si64 (recommended value of 1.780 g/t Au) and SK78 (recommended value of 4.134 g/t Au)) are inserted at a frequency of every 45-50 samples.

Blank samples are inserted at a rate of one in every 20 samples, representing an insertion frequency of 5%. Blank samples are composed of crushed, barren quartzite or gneiss and are used to check for contamination and carry-over during the crushing and pulverization stage.

The results of the blanks, duplicates, and standards are forwarded to Jaguar's head office on a monthly basis for insertion into the Jaguar's internal database (BDI). There, the results from the standards samples are scanned visually for out-of-range values on a regular basis. When failures are detected, a request for re-analysis is sent to the laboratory – only those assays that have passed the validation tests are inserted into the main database.

### *Mineral Resource Estimates - Combined*

Table 4 summarizes the Mineral Resources as of December 31, 2016 based on a US\$1,500/oz gold price. The total Mineral Resources for the Turmalina Mine Complex comprise 3.41 million tonnes at an average grade of 4.93 g/t Au containing 540,000 ounces of gold in the Measured and Indicated Resource category and 2.44 million tonnes at an average grade of 6.37 g/t Au containing 499,000 ounces of gold in the Inferred Mineral Resource category. The Mineral Resources include the Turmalina Mine and two satellite deposits, Faina and Pontal. A cut-off grade of 2.10 g/t Au was used to report the Mineral Resources for the Turmalina Mine, and cut-off grades of 3.80 g/t Au and 2.90 g/t Au were used to report the Mineral Resources for the Faina and Pontal deposits, respectively.

The conceptual operational scenarios considered during preparation of previous Mineral Resource estimates for the Faina and Pontal deposits envisioned that the fresh, unoxidized mineralization would be excavated on a satellite deposit basis and transported by truck to the existing Turmalina plant for processing. Preliminary metallurgical tests have been completed on samples of fresh, unoxidized mineralization from the two deposits from that conceptual perspective. They have yielded unacceptably low recoveries when the material is considered as potential feed to the existing Turmalina plant, and have concluded that the mineralization at both deposits is refractory.

An alternative conceptual operational scenario was developed for the current update of the Mineral Resources in which the mineralized material will be excavated by means of underground mining methods and transported to the Turmalina plant for processing. A gold-rich flotation concentrate is envisioned to be generated after appropriate upgrades have been made to the existing plant. The gold-rich flotation concentrate would then be shipped or sold to a domestic source for recovery of the gold.

**Table 4 Summary of Total Mineral Resources – December 31, 2016**

<b>Jaguar Mining Inc. – Turmalina Mine Complex</b>			
Category	Tonnes (000)	Grade (g/t Au)	Contained Oz Au (000)
Turmalina			
Measured	1,430	5.35	246
Indicated	1,307	4.12	174
Sub-total M&I	2,737	4.77	420
Inferred	765	4.81	118
Faina			
Measured	72	7.39	17
Indicated	189	6.66	42
Sub-total M&I	261	6.87	58
Inferred	1,542	7.26	360
Pontal			
Measured	251	5.00	40
Indicated	159	4.28	22
Sub-total M&I	410	4.72	62
Inferred	130	5.03	21
Total Turmalina, Faina, and Pontal			
Measured	1,753	5.38	303
Indicated	1,655	4.47	238
Sub-total M&I	3,408	4.93	540
Inferred	2,437	6.37	499

## Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are inclusive of Mineral Reserves.
3. Mineral Resources include the Turmalina Mine, Faina deposit, and Pontal deposit.
4. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au at Turmalina, 3.80 g/t Au at Faina, and 2.90 g/t Au at Pontal.
5. Mineral Resources are estimated using a long-term gold price of US\$1,500 per ounce for the Turmalina Mine and US\$1,400 per ounce for the Faina and Pontal deposits.
6. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.49 Brazilian Reais: 1 US Dollar for Turmalina and 2.5 Brazilian Reais: 1 US Dollar for Faina and Pontal.
7. A minimum mining width of approximately 2 m was used.
8. Bulk density is 2.83 t/m<sup>3</sup> for Orebodies A and B and 2.97 t/m<sup>3</sup> for Orebody C at the Turmalina mine.
9. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource estimates.

*Mineral Resource Estimate – Turmalina Mine*

The updated block model for the Turmalina Mine is based on drilling and channel sample data using a data cut-off date of December 31, 2016. The updated database comprises a total of 3,043 drill holes and 14,332 channels. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of two metres. The gold grades are interpolated using several interpolation

algorithms using capped composited assays. A capping value of 50 g/t Au was applied for all three Orebodies. The Mineral Resources are reported using the gold grades estimated by the inverse distance cubed (ID3) method. The wireframe models of the mineralization and excavated material for the Turmalina Mine, Faina Deposit, and Pontal Deposit were constructed by Jaguar and reviewed by RPA.

The mineralized material for each Orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with these orebodies.

The Mineral Resources are inclusive of Mineral Reserves. For those portions of the Mineral Resources that comprise the Mineral Reserve, stope design wireframes were used to constrain the Mineral Resource reports.

Additional Mineral Resources are present that reside beyond the Mineral Reserves. For these areas, clipping polygons were prepared to aid in the estimation of the Mineral Resources. The clipping polygons were prepared in either plan or longitudinal views, as appropriate. The clipping polygons were drawn to include continuous volumes of blocks whose estimated grades were above the stated cut-off grade, and were not located in mined out areas. The clipping polygons were used to appropriately code the block model and report the Mineral Resources. At a cut-off grade of 2.10 g/t Au, the Mineral Resources at the Turmalina Mine comprise 2.74 million tonnes at an average grade of 4.77 g/t Au containing 420,000 ounces of gold in the Measured and Indicated Resource category and 0.8 million tonnes at an average grade of 4.81 g/t Au containing 118,000 ounces of gold in the Inferred Mineral Resource category. The Mineral Resources are presented in further detail in Table 5.

**Table 5 Summary of Mineral Resources as of December 31, 2016 – Turmalina Mine**

**Jaguar Mining Inc. – Turmalina Mine**

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
<b>Orebody A:</b>			
Measured	928	6.51	194
Indicated	235	5.39	41
<b>Sub-total M&amp;I</b>	<b>1,163</b>	<b>6.28</b>	<b>235</b>
Inferred	226	3.59	26
<b>Orebody B:</b>			
Measured	338	3.22	35
Indicated	158	4.08	21
<b>Sub-total M&amp;I</b>	<b>496</b>	<b>3.51</b>	<b>56</b>
Inferred	43	5.16	7
<b>Orebody C:</b>			
Measured	164	3.19	17



Indicated	914	3.80	112
<b>Sub-total M&amp;I</b>	<b>1,078</b>	<b>3.72</b>	<b>129</b>
Inferred	496	5.34	85
<hr/>			
Total Turmalina Mine:			
<hr/>			
Total, Measured	1,430	5.36	246
Total, Indicated	1,307	4.12	174
<b>Total Measured &amp; Indicated</b>	<b>2,737</b>	<b>4.77</b>	<b>420</b>
Total, Inferred	765	4.81	118
<hr/>			

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 2.10 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US\$1,500 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 3.49 Brazilian Reals: 1 US Dollar.
5. A minimum mining width of approximately 2 m was used.
6. Bulk density is 2.83 t/m<sup>3</sup> for Orebodies A and B and 2.97 t/m<sup>3</sup> for Orebody C.
7. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
8. Mineral Resources are inclusive of Mineral Reserves.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource estimates.

*Mineral Reserve Estimate*

Mineral Reserves for Turmalina are based on the Mineral Resources as of December 31, 2016, mine designs, and external factors.

Table 6 summarizes the Mineral Reserves.

**Table 6 Mineral Reserve Estimate – December 31, 2016**

<b>Jaguar Mining Inc. – Turmalina Mine</b>				
Orebody	Classification	Tonnes (000)	Grade (g/t Au)	Au Ounces (000)
A	Proven	330	5.86	62
	Probable	196	4.66	29
C	Proven	24	3.47	3
	Probable	583	4.12	77
<b>Total</b>	<b>Proven &amp; Probable</b>	<b>1,133</b>	<b>4.69</b>	<b>171</b>

**Notes:**

1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves were estimated at a break-even cut-off grade of 2.50 g/t Au. Some stopes were included using an incremental cut-off grade of 1.20 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US\$1,250 per ounce.
4. A minimum mining width of 3 metres was used.
5. Bulk density is 2.7 t/m<sup>3</sup>.
6. Numbers may not add due to rounding.

The Mineral Reserves consist of selected portions of the Measured and Indicated Resources that are within designed stopes and associated development, designed by MCB Serviços e Mineração (MCB), a Brazilian consulting group.

Dilution and extraction (mining recovery) have been included in the reserve estimate through the following:

- Areas within the stope designs below 2.50 g/t Au. The resource wireframes were constructed at a cut-off grade of 0.50 g/t Au, and therefore include material below the reserve cut-off grade for continuity.
- Planned dilution includes areas where the stope designs run outside of the resource wireframe, to achieve minimum width and due to irregularities in geometry. 30% unplanned dilution is added, based on recent operating results.
- Extraction is assumed to be 100%. Although some losses are encountered during blasting and mucking, they are minimal, and reconciliation to mill results indicates that high dilution/high extraction assumptions match up well.

*Cut-Off Grade*

A break-even cut-off grade of 2.50 g/t Au was estimated for Mineral Reserves, using a gold price of US\$1,250/oz and average gold recovery of 90% and 2016 cost data for the Turmalina Mine. Gold prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources.

Cost data was stated in US dollars, using the exchange rate at the time of the reporting (approximately 3.5 BRL to the US dollar). A majority of Turmalina costs are denominated in BRL.

An incremental cut-off grade of 1.20 g/t Au was estimated using variable costs only. Some stopes with diluted grades between 1.20 g/t Au and 2.50 g/t Au were included in Mineral Reserves. Incremental-grade stopes make up a small proportion of the total, which RPA considers to be reasonable.

### *Mining Operations and Metallurgical Process*

The Turmalina Mine Complex consists of a number of tabular bodies known as orebodies A, B, and C. Two satellite deposits, Faina and Pontal are located along strike to the northwest.

The conceptual operational scenarios considered during preparation of previous Mineral Resource estimates for the Faina and Pontal deposits envisioned that the fresh, unoxidized mineralization would be excavated on a satellite deposit basis and transported by truck to the existing Turmalina plant for processing. Preliminary metallurgical tests have been completed on samples of fresh, unoxidized mineralization from the two deposits from that conceptual perspective. They have yielded unacceptably low recoveries when the material is considered as potential feed to the existing Turmalina plant, and have concluded that the mineralization at both deposits is refractory.

An alternative conceptual operational scenario was developed for the current Mineral Resources in which the mineralized material will be excavated by means of underground mining methods and transported to the Turmalina plant for processing. A gold-rich flotation concentrate is envisioned to be generated after appropriate upgrades have been made to the existing plant. The gold-rich flotation concentrate would then be shipped or sold to a domestic source for recovery of the gold.

The main production of the mine has been from Orebody A, which is folded and steeply east-dipping, with a strike length of approximately 250 m to 300 m, and an average thickness of six metres. Mineralization has been outlined to depths of 700 m to 750 m below surface. The southern portion of Orebody A is composed of two parallel narrow veins. The northern portion of Orebody A is much the same as the southern, however, the two parallel zones nearly or completely merge and therefore the zone is much wider overall (up to 10 m).

Orebody B includes three thinner, lower-grade lenses parallel to Orebody A. Two of the lenses are located approximately 50 m to 75 m in the structural hanging wall and are accessed by a series of cross-cuts that are driven from Orebody A. The third lens is located possibly along the axial plane. The mineralization in this deposit has been outlined along a strike length of approximately 350 m to 400 m and to depths of 650 m to 700 m below surface. Orebody B is narrow along its entire strike length.

Orebody C is a series of 14 lenses that are located to the west in the structural footwall of Orebody A and are generally of lower grade. They strike northwest and dip steeply to the northeast. A minor amount of production has been achieved from these lenses to date. The mineralization in this deposit has been outlined along a strike length of approximately 800 m to 850 m and to depths of 400 m to 450 m below surface.

### *Mining Method*

The mining method currently in use is longhole sublevel stoping with delayed backfill. Backfill consists of cemented rock fill, or a paste fill product prepared from detoxified CIP tailings in a plant located near the mill.

The mine is accessed from a five metre by five metre primary decline located in the footwall of the deposit. The portal is located at elevation 695 m. The mine is divided into levels with Level 1 established at elevation 626 MASL. Starting at this level, the vertical clearance between levels is 114 m in the upper portions of the mine (i.e., Level 2 is at elevation 512 m). Five sublevels, spaced 20 m apart vertically, are driven from the main ramp. Since the initial development phases, level spacing has been modified so that the mining method could more easily adapt to changing conditions and modifications to the mining method. The current level spacing is 75 m with sublevels placed every 15 m vertically. A three-metre-thick sill pillar is left at each level, except for Level 3.

At each level and sublevel, drifts are developed in the mineralized zone to expose the footwall and the hanging wall contacts. The drift is extended in both directions along strike, under geological control for alignment, continuing to expose the contacts until the limits of the orebody are reached.

Orebody A and C are the primary structures being mined, while mining in Orebody B is suspended pending review of economics. Orebody A is located in the footwall of the shear zone and Orebody B in the hanging wall of the shear structure.

Orebody A is closest to the main ramp and is accessed first. Development is currently progressing to Level 10 in Orebody A.

Orebody C is a secondary system being mined to the west of the portal. It is of lower grade than orebodies A or B. Orebody C is accessed from the main ramp at Level 2. A separate internal ramp is near completion, which will reduce haul distance to the run-of-mine ore stockpile.

Past mining used a longitudinal retreat sequence for Orebodies A and B – stope extraction began at the ends of the levels and retreated back towards the access. Stopes are 50 m in length along strike and separated by a five metre to ten metre wide pillar, depending on the thickness of the zone. Once mining of each longhole stope has been completed, the excavation is filled using a combination of development waste and pumped paste fill. A bund is constructed using development waste to contain the backfill. Once the cement content of the paste fill has been allowed to set, the next stope in the sequence can be mined. The sequence continues until the entire level/sublevel is mined. Mining then proceeds upward to the next sublevel until the sill pillar is reached. Stopes are mined from several individual levels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

The retreat sequence, and the need to complete Orebody B mining before cutting off access by mining Orebody A, reduced productivity by limiting the number of stopes available for mining at a given time.

The current LOMP does not consider mining of Orebody B, and involves a change in mine design. Orebody A will be mined in a primary / secondary sequence via transverse access to the thick centre portion of Orebody A, requiring additional accesses developed in waste. Each primary or secondary stope is 15 m along strike, with no pillars. The design change has the effect of increasing the number of available workplaces, and de-links the narrow, lower-productivity ends from the centre.

Although Orebody B is not in the LOMP, and no longer included in Mineral Reserves, future access is possible, either by mining through cemented paste fill and supporting appropriately, or by mining concurrently with the thinner ends of Orebody A.

#### *Environmental Considerations*

Environmental studies related to the acid mine drainage potential are being made as requested by SUPRAM on LO 012/2008 (“Licença de Operação” - Operation License). Those studies will be performed until the end of mining and milling operations at Turmalina. All the environmental costs for the Turmalina Project are associated with obligations laid out in the various licenses.

Jaguar has all the necessary environmental licenses for the operation of the Turmalina mining complex.

#### *Taxes*

Income taxes are 34% of taxable profit, including a 25% corporate tax rate and a 9% social contribution. In addition to direct operating costs, royalty payments and depreciation are deductible in determining taxable profit.

### *Mine Life*

The current life of mine plan, based on Mineral Reserves, details mining operations at Turmalina to 2020. There is good potential to extend the mine life, through infill drilling and further conversion of Mineral Resources to Mineral Reserves.

### *Markets*

The principal commodity at the Turmalina Mine is freely traded, at prices that are widely known, so that prospects for sale of any production are virtually assured. A gold price of \$1,250 per ounce was used for estimation of Mineral Reserves.

## 2. Caeté Mining Complex

The scientific and technical information contained in this AIF relating to the Company's Caeté Mining Complex up to December 31, 2015 is derived from the technical report titled "*Technical Report on the Roca Grande and Pilar Operations*", filed on SEDAR on April 18, 2016 (with an effective date of April 15, 2016), (the "Caeté Technical Report") which was prepared by Jason Cox, P. Eng. and Reno Pressacco, P. Geo, both from RPA, who are both "qualified person" as that term is defined in NI 43-101. Updated Mineral Resource and Mineral Reserve estimates as of December 31, 2016 are noted below.

### *Property Description and Location*

The Caeté mining complex, which includes the Pilar and Roça Grande mines and the Caeté Plant, is located in the state of Minas Gerais, Brazil, 50 kilometres to 100 kilometres east of the city of Belo Horizonte. The property is currently constituted of 10,136.58 hectares of mining and exploration concessions. The property is owned through Jaguar's wholly-owned subsidiary, MSOL.

In December 2003, Jaguar acquired the Santa Bárbara property, which includes the Pilar mineral concessions, from Vale. In November 2005, Jaguar entered into a mutual exploration and option agreement with Vale with respect to six concessions, known as the Roça Grande concessions, located on 2,090 hectares of highly prospective gold properties along 25 kilometres of a key geological trend in the Iron Quadrangle. The contract between Jaguar and Vale provided Jaguar with the exclusive right over a 28-month period beginning November 28, 2005 to explore and conduct feasibility studies and to acquire gold mining rights in the Vale properties if the studies supported economical mining operations. The contract granted corresponding rights for Vale to explore the Jaguar property for iron and acquire mineral rights in the property during a three-year period. In November 2007, Jaguar notified Vale of its intent to exercise the option to acquire all seven Roça Grande concessions. The final transfers of the Roça Grande concessions to Jaguar were concluded in December 2010 and August 2011. In November 2014, four of the six Roça Grande concessions acquired from Vale were returned to Vale by amending the original contract.

The mining concessions related to Caeté's Roça Grande and Pilar mines are in good standing. Jaguar has all the necessary environmental licenses that are required for the operation of the mining complex.

### *Accessibility, Climate, Local Resources, Infrastructure and Physiography*

The Roça Grande and Pilar mines are located in the municipalities of Caeté and Santa Bárbara, respectively, in the state of Minas Gerais, Brazil. Caeté (35,000 inhabitants) and Santa Bárbara (30,000 inhabitants) are comparable towns, located 55 kilometres and 100 kilometres, respectively, from Belo Horizonte.

The towns have good urban infrastructure, including banks, hospitals, schools and general commerce. Skilled labor is readily available.

The properties can be accessed via a federal highway and state paved roads. A partially paved 27-kilometre secondary road is used to transport Pilar ROM to the Caeté Plant.

Annual rainfall in area averages between 1,300 millimeters and 2,300 millimeters, 84% of which falls during the rainy season between October and March. December and January present the most intense precipitation. Winds, predominantly from the south and southeast, have a low average speed (<1 m/s). The annual average temperature is slightly above 20°C. Air humidity ranges up to 90% even in the summer months. Annual average evaporation is approximately 934 millimeters.

Power to the project site is currently supplied by CEMIG. Diesel back-up generators provide emergency power.

### *History*

Jaguar acquired the Pilar property from Vale in December 2003 and in November 2005, the two companies entered into a mutual exploration and option agreement with respect to the Roça Grande mineral concessions.

Jaguar initiated exploration activities at Pilar in 2006 and initially contemplated building a sulfide plant on site, but the acquisition of the Roça Grande concessions created an opportunity to develop an expanded project, with greater plant capacity to receive ore from several mineral properties.

During 2007, a number of key events occurred with respect to the Caeté Project. Jaguar completed a scoping study, received the Implementation License for the Project, secured the power contract for the start-up and commissioned TechnoMine to prepare a NI 43-101 technical report on the Caeté Project mineral resources, which was completed during the year.

In September 2008, expansion plans at the Caeté Project continued as TechnoMine completed the NI 43-101 feasibility study technical report. By the end of the third quarter in 2008, all necessary permits and licenses for the construction and commissioning phase of the Caeté Project had been received and Jaguar initiated civil works for the milling and treatment circuits.

In November 2008, due to the decline in gold prices, the financial markets and worldwide equity values, including the gold sector, Jaguar temporarily suspended development of the Caeté Project pending an assessment of market conditions and the availability of capital to move the project forward. Consistent with the decision to suspend the development of the Caeté Project, underground work at the Roça Grande Mine was temporarily suspended; however, development at the Pilar Mine continued.

In December 2008, Jaguar began transporting ore by truck from the Pilar Mine to the Paciência Plant to supplement the ore being supplied from Paciência's Santa Isabel Mine.

In March 2009, Jaguar completed an \$86.3 million equity offering, the proceeds of which were primarily used to restart development and construction at Caeté. During 2009 and part of 2010, Jaguar focused on the implementation and construction of the Caeté Project. The Caeté Plant was commissioned in June 2010. The first gold pour was conducted in August 2010 and commercial production was declared in October 2010. Capital expenditures for the Caeté Project totaled US\$127 million.

In October 2010, TechnoMine completed an amendment to the 2008 feasibility study, which consisted of an enhancement of the process route and updated Mineral Resource and Mineral Reserve estimates afforded by an increase of the gold price over the life of mine ("LOM").

In June 2011, Jaguar filed a NI 43-101 compliant technical report prepared by TechnoMine on a number of targets located within the Caeté mining complex. This technical report added 159,250 ounces of Measured and Indicated Mineral Resources and 92,040 ounces of Inferred Mineral Resources for the Caeté mining complex.

During 2012, an operational review of the Caeté operation determined that operational overhead could be reduced and productivity improved without impacting long-term production capability. It was also determined to transition the operation to smaller ore and waste development headings, reduced stope dimensions and new ground control methodologies in order to improve head grade over historical results through reduced dilution. The new ground control methodology is progressing and work is ongoing on the transition toward smaller heading. The changes are being implemented concurrently with continuing operations and are expected to reduce the cash operating cost per ounce and allow for increased and more predictable ounce production.

Gold production at Caeté decreased to 33,350 ounces in 2016, as compared to 39,762 ounces in 2015.

Please refer to section General Development of the Business – Caeté Mining Complex – Production, Added Mineral Resources, Operational Review for recent developments regarding the Caeté Mining Complex.

### *Geological Setting*

Shortly after the Portuguese discovered Brazil in 1500, Portuguese explorers known as Bandeirantes ventured into the interior of the country from Rio de Janeiro and Salvador and discovered alluvial gold in the mid-16<sup>th</sup> century. Later on, the Bandeirantes ventured into the country's interior primarily from São Paulo. Gold found in stream drainages in several parts of the Iron Quadrangle was a major factor in the development of the region. During the 17<sup>th</sup> and 18<sup>th</sup> centuries, an era commonly referred to as the Brazilian Gold Cycle, mining in the Caeté and Santa Bárbara region included numerous moderate size mines, such as Gongo Soco, Cuiabá, Taquaril, São Bento, Santa Quitéria, Pary, Luis Soares, Juca Vieira and Brumal.

The Iron Quadrangle was the principal region for the Brazilian hard rock gold mining until 1983 and accounted for about 40% of Brazil's total gold production. Gold was produced from numerous deposits, primarily in the northern and southeastern parts of the Iron Quadrangle, most hosted by Archean or Early Proterozoic banded iron formations (bif) contained within greenstone belt supracrustal sequences.

The ore bodies are emplaced in Archean age meta-volcanic and meta-sedimentary rocks of the Nova Lima Group. The hosting rocks are intensively folded and sheared along a NE-SW regional trend.

- *Pilar*

The Pilar Ore Body is located at the base of the Nova Lima Group, a unit with a predominance of meta-mafic and meta-ultramafic rocks constituted of both clastic and chemical meta-sediments. The volcanic rocks predominantly consist of talc schist, meta-basalts, meta-dunites, meta-peridotites and serpentinites. Secondarily, schist occurs with variable amounts of carbonaceous material, sericite, carbonate, chlorite and quartz. Banded Iron Formation (BIF) and meta-chert layers are hosted in the meta-sediment unit.

Original bedding can be observed, with variable directions due to folds, resulting in an average axis of approximately 135°/45°. The main BIF layer as mapped at Pilar site is continuous along 10 kilometres of strike length and width variable between 5 meters to 50 meters. At the Pilar property, the BIF northern extremity, known as São Jorge target, is intercepted by a shear zone resulting in strong hydrothermal alteration of the BIF. At surface, the São Jorge target gold mineralization is characterized by high contents of limonite, as a result of the weathering of the sulphides found in underground (pyrite, pyrrhotite, and arsenopyrite).

Hydrothermal alteration related to the shear zone, is characterized by the introduction of large quantities of sericite, chlorite, carbonate, silica, sulfides and gold.

A preliminary interpretation of the gold mineralization at the Pilar mine is that the BIF and gold were deposited simultaneously in an early mineralization event. Later, due to the shearing events, additional gold was intruded in the system culminating in remobilization and concentration and generating the known ore shoots. Average azimuth

and inclination of the ore shoots varies from E76° - 83° S / 38° -42° respectively. The regional foliation (S<sub>2</sub>) is very well preserved in all schists showing regular direction of N30° - 50° E / 40° -65°.

Inverse faulting (low angle thrust faults are observed at the western border of the Pilar mine, resulting in the older rocks (talc schists) repositioning over the younger rocks. As a result, the ore bodies associated to the eastern BIF flank constitute “blind” targets, being identified only after underground development of the Eastern ore bodies.

- *Roça Grande*

The Roça Grande mine is hosted in the upper unit of the Nova Lima Group. Dominant rock types at Roça Grande are meta-volcanoclastics (tuffs), represented by quartz-sericite-chlorite schists with variable amounts of carbonaceous material, Banded Iron Formation (BIF), metacherts and graphitic schists. Bedding is well defined by the iron carbonate and siliceous facies of the BIF horizons, with an average strike of N70° E, dipping about 30° SE.

Folds are very common and present a regular fold axis azimuth of approximately 110°/30°. A total of four BIF horizons are recognized in the Roça Grande property. Two of them host the mineralization as identified during the Vale and Jaguar exploration. They are roughly parallel and are called Structures 1 and 2. The Northern Structure (Structure 1) hosts the RG-01 mineralized body and the South Structure (Structure 2) hosts the RG-02, RG-03 and RG-06 mineralized bodies. The RG-07 mineralized body, associated to quartz lodes is located immediately in the hanging wall of Structure 1.

All rocks examined in the Pilar and Roça Grande orebodies were subjected to different degrees of hydrothermal alteration that resulted in the development of carbonate, chlorite, sericite haloes, and quartz veins. Disseminated sulfides (pyrite, arsenopyrite, stibnite, pyrrhotite, and chalcopyrite) in the quartz veins are common.

#### *Mineralization*

- *Pilar*

The mineralization at the Pilar Mine is hosted by a number of the host rock units including the BIFs along with mafic schists and talc-chlorite schists. Gold mineralization is associated with sulphide mineralization consisting of arsenopyrite and pyrrhotite. Quartz veins and veinlets can also be present, but the presence of quartz is not a prerequisite for higher gold values. The sulphide minerals occur mostly as disseminations in the host rock, but can achieve semi-massive to massive concentrations locally over a few tens of centimetres. Quartz veins are typically less than one metre in width and can be observed to be of two generations. The quartz veins of the first generation are typically associated with the gold mineralization and are folded. The quartz veins of the second generation are typically lower grade or barren and not affected by folding.

The SW Orebody is hosted by iron formation of the Santa Quitéria Unit. The remaining mineralized lenses are hosted by the mafic and ultramafic schists of the Ouro Fino and Morro Vermelho Units.

- *Roça Grande*

At Roça Grande, gold mineralization is more commonly associated with BIF horizons. In RG01, RG02, RG03, and RG06 mineralized bodies, the gold mineralization is developed roughly parallel to the primary bedding and is related to centimetre-scale bands of massive to disseminated pyrrhotite and arsenopyrite. In many cases, better gold values are located along the hanging wall contact of the iron formation sequence and is hosted by carbonate-facies iron formation. The grades generally decrease towards the footwall where the iron formation becomes more silica-rich. The thicknesses of the iron formations are observed to be affected by broad-scale boudinaged structures. Better gold grades are found in the thicker portions while the narrower portions of the boudinaged structures have lower grades. Late-stage, barren quartz veins are also ubiquitously present and also display a boudinaged form.



In the RG07 mineralized body, gold is found to be hosted in quartz veins that are contained within a sericite (chlorite) schist associated with an east-west oriented shear zone (Machado 2010).

### *Deposit Types*

Gold mineralization has been found mainly within three general types of deposits in the Iron Quadrangle:

1. Syngenetic deposits. These are hosted by BIF and chemical sedimentary rocks (meta-chert). Gold is typically associated with fresh to limonite-rich sulphide masses, ranging from disseminated to massive, in association with the BIF layers or in hydrothermally altered schists rich in quartz, chlorite, and sericite. Disseminated sulphides hosted in quartz schist, BIFs, and meta-cherts have also been economically exploited.
2. Epigenetic deposits dominated by hydrothermal quartz veins (silicification zones). Gold is related with masses of milky to microcrystalline quartz containing fresh to limonite-rich sulphides and, sometimes, visible gold. The veins are hosted by hydrothermally altered schists rich in quartz, chlorite, carbonate, and sericite.
3. Paleo-placer deposits. Conglomerates are found in the geologic section that contains clasts of quartzite, milky quartz, massive and banded chert, felsic volcanic rocks, and quartz schists. The matrix can be quartzitic, arkosic, or carbonaceous. Locally, round (buckshot) pyrite and crystalline pyrite are abundant in the matrix.

Most gold-bearing units in the Iron Quadrangle, with the exception of the gold-bearing conglomerates, are strongly controlled by linear structures such as fold axes, stretching lineations, and intersection foliations. The orebodies form cigar or pencil shapes, showing continuity along the plunge and relatively small distances laterally. They can be longer than 5 km, such as at the Morro Velho and Cuiabá Mines. The thickness of the deposits varies from a few centimetres to more than 30 m.

Gold is associated with sulphides, mainly pyrite, pyrrhotite, and arsenopyrite. The distribution of the mineralized bodies is often controlled by mineral stretching lineations and fold axes.

### *Exploration History*

- *Pilar*

In 2006, Jaguar started an exploration campaign at the Pilar property in order to complete a mineral resource evaluation in accordance with NI 43-101 guidelines.

In 2010 and during 2011 Jaguar completed an underground drilling program to investigate the down plunge continuity of the mineralization between levels 4 and 10 at the Pilar Mine.

In 2014 the magnetic data from the airborne CODEMIG survey was re-processed.

High definition induced polarization (IP) ground survey covering the south extension of the Pilar Mine was carried out in 2015. The estimated depth of penetration of the survey was up to 1,000 m.

Geological mapping and a total of 744 soil samples were collected on the Pacheca and Cubas targets in 2015. Anomalous values (0.15 g/t Au to 0.48 g/t Au) were outlined along an 800 m long area oriented in northeast-southwest direction.

- *Roça Grande*

Initial exploration activities carried out by Vale in the Roça Grande Mine area consisted of regional geological, geochemical and geophysical surveys, along with excavation of a number of exploration trenches and diamond

drilling to evaluate the gold mineralization found in the area. In total, 4,746 stream sediment samples were collected and 4,350 m of trenches were excavated during the 1973 to 1993 period.

Soil sampling programs have been carried out throughout the various claim blocks that comprise the CCA project. Jaguar has intensively drilled the Roça Grande ore bodies. Four mineralized bodies named RG01/07, RG02, RG03, and RG06 were selected for infill diamond drilling and underground exploration started in the RG01/07 body. The following has been completed through December 2010:

- RG01/07: 10,625 metres in 111 surface and underground drill holes and 5,906 metres in ramps and drifts
- RG02: 16,580 metres in 59 surface drill holes and 1,168 metres in ramps and drifts
- RG03: 9,407 metres in 56 surface drill holes
- RG06: 7,954 metres in 55 surface drill holes

During 2011 and subsequent to the Caeté Feasibility Study, Jaguar completed 9,983 metres in 71 drill holes at the RG01/07 body as part of an underground infill drilling program. In 2012 and 2013, Jaguar performed 13,922 metres and 10,142 metres of underground delineation drilling, respectively, in RG01/07.

#### *Drilling*

- *Pilar*

In 1989 Vale carried out the first exploratory drilling at the Pilar deposit. From 1989 to 1994 a total of 11,163 metres of exploratory diamond drilling were performed. Eldorado Gold Corp. executed a 3,069 metre diamond drilling campaign to evaluate the deposit from 2002 to 2003 (Machado, 2010).

In 2006, Jaguar started an exploration campaign at the Pilar property that targeted the Pilar Sul, São Jorge, and São Jorge Extensão sectors of the deposit. The exploration effort comprised three phases as follows:

Phase 1: After interpretation of the available data, an exploratory diamond drilling program was carried out to test the structural controls and the continuity of the mineralization to 200 metres below the surface. Mineralized shoots mainly occurred within the BIF. The holes intercepted several significant mineralized intervals and pointed out the need for additional investigation of the structural geology of the area. During this phase, a total 6,489 metres was drilled in 36 diamond drill holes.

Phase 2: Diamond drill holes tested the structural control and the continuity of the mineralization to 300 metres below surface. Mineralized shoots occurred both within the BIF and the shear zone. A total of 12,926 metres in 41 holes was drilled during Phase 2.

Phase 3: Phase 3 included underground exploration and underground and surface diamond drilling. Infill underground drilling was completed to delineate mineralization at 693 MASL. Surface drilling was carried out to obtain more data on the structural control and the main zones of mineralization. Through December 2010, Jaguar completed a total of 10,390 metres in ramps and drifts, 11,200 metres of underground drilling in 180 holes, and 10,186 metres of surface drilling in 19 holes.

Late in 2010 and during 2011 (subsequent to the Caeté Feasibility Study), Jaguar completed an underground drilling program to investigate the down plunge continuation of the mineralization to Level 11, approximately 860 metres from surface. A total of 12,574 metres in 44 drill holes were completed, confirming the extension of the mineralized zones to depth. Delineation drilling underground continued in 2012 and 2013.

A small program of exploration drilling (9 holes, 910 metres) was carried out in November 2014 to test near surface targets in the proximity of the crown pillar of the Pilar Mine. In late 2014 to May 2015, Jaguar carried out an

underground exploration drilling program focused on testing for additional gold mineralization along the down-plunge projections of the AB, and C orebodies. In all, 90 holes were completed for a total length of 14,875 metres.

The drilling procedures at the Pilar Mine were similar to those used at the Roça Grande Mine. Surface diamond drilling was carried out by the drilling contractor Mata Nativa. The underground drilling program in 2015 was completed by Geosol Ltd. of Belo Horizonte using BQ (36.5 mm) and LTK (36.3 mm) sized equipment. Infill drilling programs carried out from underground stations were completed by Jaguar staff and company-owned equipment.

A summary of the drilling campaigns completed at the Pilar Mine is provided in Table 7 and a summary of significant intersections from the 2014/2015 exploration program is provided in Table 8. It is important to note that the reported intersections do not represent true thicknesses as they have been drilled from underground-based platforms and consequently have intersected the mineralized zones at varying angles.

**TABLE 7 SUMMARY OF DRILLING CAMPAIGNS, PILAR MINE  
Jaguar Mining Inc. – Caeté Operations**

Period	Target	Diamond Drilling		Roto-Percussive Drilling	
		No. Holes	Total Length (m)	No. Holes	Total Length (m)
<b>VALE</b>					
1989-1994		65	11,812	60	2,960
2002-2003		10	3,069		
<b>Sub-Total, Vale</b>		<b>75</b>	<b>14,881</b>	<b>60</b>	<b>2,960</b>
<b>JAGUAR</b>					
2004-2010	Phase 1	36	6,489		
	Phase 2	41	12,926		
	Phase 3-UG	180	11,200		
	Phase 3-Surface	19	10,186		
Q4 2010-2011		44	12,574		
2012	UG-Exploration	31	4,005		
	UG-Definition	121	9,705		
2013	UG- Exploration	40	5,978		
	UG-Definition	51	3,557		
2014	UG- Exploration	60	8,398		
	UG-Definition	125	10,818		
	Surface Expl.	9	910		
2015	UG- Exploration	30	6,477		
	UG-Definition	12	879		
<b>Sub-Total, Jaguar</b>		<b>799</b>	<b>104,102</b>		

**TABLE 8 SUMMARY OF SIGNIFICANT INTERSECTIONS, Q3 2014-MAY 2015  
EXPLORATION DRILLING PROGRAM, PILAR MINE  
Jaguar Mining Inc. – Caeté Operations**

<b>Hole ID</b>	<b>Orebody</b>	<b>From</b>	<b>To</b>	<b>Length (m)</b>	<b>Average Grade Au (g/t)</b>	<b>Elevation</b>
PPL261	BF	70.40	74.00	3.60	7.52	262
PPL287	BFII	110.50	126.95	16.45	5.07	302
PPL299	BFII	203.50	222.50	19.00	4.06	142
Including	BFII	203.50	210.35	6.85	6.93	142
PPL300	BF	163.35	183.40	20.05	3.83	162
PPL300	BFII	197.60	208.00	10.40	4.64	144
PPL301	BF	203.40	209.85	6.45	5.29	124
PPL301	BFII	211.40	219.40	8.00	4.76	119
PPL301	BFII	243.70	246.20	2.50	22.24	99
PPL303	BF	151.20	153.60	2.40	12.44	176
PPL303	BFII	166.50	193.40	26.90	3.03	159
PPL305	BF	136.10	142.90	6.80	4.67	180
PPL306	BFII	213.20	220.70	7.50	9.43	100
Including	BFII	218.00	220.70	2.70	22.32	100
PPL306	BFII	239.35	247.20	7.85	5.65	79
PPL309	BFII	48.40	51.80	3.40	8.68	236
PPL312	BF	108.35	113.55	5.20	5.38	217
PPL313	BF	89.30	93.05	3.75	8.33	228
PPL313	LPA	99.15	102.05	2.90	12.31	224
PPL314	BF	87.00	96.25	9.25	7.26	247
PPL314	BF	115.30	123.10	7.80	7.11	245
PPL316	BF	99.60	109.70	10.10	6.59	211
PPL316	BFII	131.10	137.30	6.20	7.57	193
PPL317	BF	91.90	98.70	6.80	3.88	228
PPL317	BFII	112.00	118.50	6.50	8.32	218
PPL318	BF	122.95	130.50	7.55	8.57	192
PPL318	BFII	154.65	159.40	4.75	5.69	172
PPL319	BFII	135.20	146.35	11.15	9.48	158
FSB553	BFII	26.80	29.50	2.70	8.69	293
FSB552 A	BFII	18.80	28.60	9.80	13.74	275
FSB551	BFII	29.90	33.60	3.70	10.12	284

<b>SUMMARY OF SIGNIFICANT INTERSECTIONS, 2016 DRILLING PROGRAM, PILAR MINE</b>					
<b>Hole ID</b>	<b>Date</b>	<b>From (m)</b>	<b>To (m)</b>	<b>DownHole Interval (m)</b>	<b>Gold Grade (g/t Au)</b>
PPL321	2016	114.30	123.95	9.65	6.34
		130.80	131.95	1.15	25.40
PPL325	2016	107.10	123.45	16.35	7.73
		141.50	146.60	5.10	5.13
PPL326	2016	78.00	83.65	5.65	7.10
		90.25	95.90	5.65	24.19
PPL327	2016	105.30	109.75	4.45	5.33
PPL328A	2016	149.90	154.20	4.30	12.91
PPL330A	2016	119.25	124.30	5.05	4.11
PPL334	2016	173.40	180.60	7.20	6.09
PPL337	2016	99.75	105.85	6.10	4.35
PPL338	2016	23.05	24.90	1.85	11.24
		72.80	74.60	1.80	31.72
PPL339C	2016	73.25	74.85	1.60	27.59
PPL340	2016	52.85	60.75	7.90	9.05
PPL343	2016	137.50	146.00	8.50	3.92
PPL347	2016	13.95	25.20	11.25	3.27
PPL350	2016	167.70	172.90	5.20	12.92
		179.65	186.10	6.45	5.05
PPL351	2016	122.45	124.45	2.00	19.83
PPL357	2016	32.35	41.00	8.65	4.94
PPL363	2016	54.55	58.55	4.00	23.95
		32.65	40.45	7.80	6.25
PPL377	2016	55.80	63.90	8.10	4.33
PPL380	2016	64.10	66.80	2.70	13.16

- Roça Grande

Jaguar has carried out a number of surface-based and underground-based drilling programs at the Roça Grande Mine since entering into a mutual exploration and option agreement with Vale in 2005. These in-fill and exploration drilling programs were focussed primarily on the RG01/07, RG02, RG03, and RG06 deposits.

Jaguar started diamond drilling at Roça Grande in August 2006. Following the completion of the first exploratory holes drilled at the RG01/07, RG02, RG03, and RG06 mineralized zones, Jaguar carried out an infill program to delineate these zones.

The drill hole lengths ranged from 40 m to 559 m. Holes were targeted to investigate the continuity of the mineralized zones laterally and at depth. Core diameters are consistently HQ (63.5 mm) from surface through the weathered rock to bedrock. At one to three metres into the bedrock, the holes were reduced to NQ diameter (47.6

mm). Surface diamond drilling was carried out by the drilling contractor Mata Nativa while the underground in-fill drilling programs were carried out by Jaguar staff using company-owned equipment.

The diamond drill core procedures adopted by Jaguar are described below:

- Only drill holes with more than 90% core recovery from the mineralized zone were accepted.
- Drill hole deviations (surveys) were measured by Sperry-Sun or DDI/Maxibore equipment.
- The cores were stored in wooden boxes of one metre length with three metres of core per box (HQ diameter) or four metres of core per box (NQ diameter). The hole's number, depth, and location were identified in the boxes by an aluminum plate on the front of the box and by a water-resistant ink mark on its side. The progress interval and core recovery are identified inside the boxes by small wooden or aluminum plates.

Drill collars were set out using a theodolite or global positioning system (GPS). All holes were drilled within three metres of the intended planned location. Azimuth and inclination for the angle holes were set by Brunton compass, deemed accurate to within 2° azimuth and <1° inclination.

Following completion of the holes, the collars were surveyed with theodolite and cement markers were emplaced. Downhole surveys were completed on all holes more than 100 m long using Maxibor equipment.

A small program of 14 surface-based exploration holes, for a total length of 794 metres, was completed in September 2014 to test targets in the areas of the existing open pit mines.

A summary of the drilling campaigns completed at the Roça Grande Mine is provided in Table 9.

**TABLE 9 SUMMARY OF DRILLING CAMPAIGNS, ROÇA GRANDE MINE**  
**Jaguar Mining Inc. – Caeté Operations**

Period	Target	Diamond Drilling		Roto-Percussive Drilling		
		No. Holes	Total Length (m)	No. Holes	Total Length (m)	
<b>Vale</b>						
1973-1993	Roça Grande	116	18,288			
1994-1995	Roça Grande			313	17,270	
1996-1999	RG01	8	550			
	RG02	9	910			
	RG05	18	1,530			
	RG03,04 and 06	10	625			
	2000	RG02	4	410		
		RG03	8	571		
RG05		1	63			
RG06		3	379			
<b>Sub-Total, Vale</b>		<b>177</b>	<b>23,325</b>	<b>313</b>	<b>17,270</b>	
<b>Jaguar</b>						
2004-2010	RG01/07	111	10,625			
	RG02	59	16,580			
	RG03	56	9,407			
	RG06	55	7,954			
2011	RG01/07	71	9,983			
2012	RG01/07		19,922			
2013	RG01/07		10,142			
2014	RG03/RG06	14	794			
<b>Sub-Total, Jaguar</b>			<b>79,407</b>			

*Sample Preparation, Analysis and Security*

Sampling

The sampling procedures used by Jaguar are as follows.

Surface/Exploration Channel Sampling

- Channel samples are collected from outcrops and trenches as needed.
- The sites to be sampled are cleaned with a hoe, exposing the material by scraping it.
- Structures are mapped and the lithologic contacts defined, and samples marked so that no sample has more than one lithology.
- Samples have a maximum length of one metre and are from one kilogram to two kilograms in weight.
- Each sample is collected manually in channels with average widths between five and ten centimetres, and about three centimetres deep, using a hammer and a chisel.
- Either an aluminum tray or a thick plastic canvas drop sheet is used to collect the material.
- The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.

- At the sampling site, samples are identified by small aluminum plates, labels, or small wooden poles.
- Sketches are drawn with lithological and structural information. The sample locations are surveyed.

#### Diamond Drilling Core Sampling

- Surface drilling is performed by contractors with holes in HQ or NQ diameters.
- Underground drilling is performed either by Jaguar or contractors with holes in BQ and LTK diameters.
- Drill holes are accepted only if they have more than 85% of core recovery from the mineralized zone.
- All the drill holes have their deviations measured by Maxibor or equivalent survey tool.
- The cores are stored in wooden boxes of one metre length with three metres of core per box (HQ diameter) or four metres of core per box (BQ or LTK diameters).
- The number, depth, and location of each hole are identified in the boxes by an aluminum plate or by a water-resistant ink mark in front of the box.
- The progress interval and core recovery are identified inside the boxes by small wooden plates.
- During logging, all of the geological information, progress, and recovery measures are verified and the significant intervals are defined for sampling.
- Samples are identified in the boxes by highlighting their side or by labels.
- Samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- One half of the sample is placed in a highly resistant plastic bag, identified by a label, and the other half is kept in the box at a warehouse.
- The remaining drill core from the surface-based drill holes is stored at a dedicated core storage facility that is located at the Roça Grande Mine.
- For many of the underground-based drill holes, samples are cut lengthwise with the help of a diamond saw and a hammer into approximately equal halves.
- For the shorter-length, bazooka-type drill holes completed from underground set-ups, the whole core is sampled as the core diameter does not permit splitting into halves.

#### Underground Production Channel Sampling

- The sector of wall to be sampled is cleaned with pressurized water. Structures are mapped and lithologic contacts defined, and samples marked so that no sample has more than one lithology. Samples have a maximum length of one metre and are from two to three kilograms in weight.
- Channel samples were taken by manually opening the channels, using a hammer and a small steel pointer crowned by carbide or a small jackhammer.
- The channel samples have lengths ranging from 50 cm to one metre, average widths between five and ten centimetres, and are approximately three centimetres deep.
- Two sets of channel samples are regularly collected on the face. One set of channel samples is taken from the top of the muck pile once the work area has been secured. The second set of channel samples is taken at the waist height once the heading has been mucked clean and secured.
- Channel samples from the walls and back are collected at approximately 5 m intervals. The channel samples are collected starting at the floor level on one side and continue over the drift back to the floor on the opposite side.
- Either an aluminum tray or a thick plastic canvas is used to collect the material. The samples are then stored in a thick plastic bag and identified by a numbered label, which is protected by a thin plastic cover and placed with the sample.
- At the sampling site, samples are identified with paint.

For surface-based exploration drill holes, samples were prepared at the SGS laboratories in Belo Horizonte. For other drill holes and channels, samples are prepared at Jaguar's mine site laboratories by drying, crushing to 90% minus 2



mm, quartering with a Jones splitter to produce a 250 g sample, and pulverizing to 95% minus 150 mesh. Analysis for gold is by standard fire assay procedures, using a 50 g or 30 g sample and an atomic absorption (AA) finish.

All samples from the 2015 exploration drilling programs executed at the Pilar and Roça Grande mines were analyzed for gold at Jaguar's mine site laboratory.

The SGS laboratory based in Belo Horizonte meets international analytical standards and ISO 17025 compliance protocols. Analytical results from the SGS laboratory were forwarded to Jaguar's Exploration or Mine Departments by e-mail, followed by a hard copy.

At Jaguar's Caeté laboratory, samples from the Roça Grande and Pilar mines are dried and then crushed. A one kilogram sub-sample of the crushed material is selected for pulverization to approximately 70% minus 200 mesh. The ring-and-puck pulverizers are cleaned after each sample using compressed air and a polyester bristle brush. The analytical protocol for all samples employs a standard fire assay fusion using a standard 30 g aliquot, with the final gold content being determined by means of AA. The detection limit for fire assay analyses is 0.05 g/t Au. A second cut from the pulps is taken and re-assayed for those drill core samples where the grade is found to be greater than 30 g/t Au. If the two assays are in good agreement, only the first assay is reported. The AA unit is calibrated to directly read gold grades up to 3.3 g/t Au; samples with grades greater than this are re-assayed by diluting the solute until it falls within the direct-read range.

The sample locations are surveyed.

#### *Quality Assurance and Quality Control*

The Caeté laboratory carries out an internal program of Quality Assurance/Quality Control (QA/QC) for all drill core samples. The QA/QC protocol includes carrying out a duplicate analysis after every 20 samples, representing an insertion frequency of 5%.

Commercially sourced standard reference materials (Rocklab standards Si64 (recommended value of 1.780 g/t Au), SH69 (recommended value of 1.346 g/t Au) and SK78 (recommended value of 4.134 g/t Au)) are inserted at a frequency of every 45 to 50 samples. In 2015, the Jaguar Caeté laboratory used 1,880 samples of standard Si64, 324 samples of standard SH69, and 1,556 samples of standard SK78.

Blank samples are inserted at a rate of one in every 20 samples, representing an insertion frequency of 5%. Blank samples are composed of crushed, barren quartzite or gneiss and are used to check for contamination and carry-over during the crushing and pulverization stage. A total of 1,880 blank samples were used by the Caeté laboratory in 2015.

A total of 480 samples were forwarded to the SGS Intertek laboratory for third-party check analyses and the analytical results compared favourably with the Caeté analyses.

The results of the blanks, duplicates, and standards are forwarded to Jaguar's head office on a monthly basis for insertion into the Jaguar's internal database (BDI). There, the results from the standards samples are scanned visually for out-of-range values on a regular basis. When failures are detected, a request for re-analysis is sent to the laboratory. Only those assays that have passed the validation tests are inserted into the main database.

#### *Mineral Resource Estimates (combined)*

Table 10 summarizes the Mineral Resources as of December 31, 2016 based on a US\$1,400/oz gold price. The total Mineral Resources for the Caeté Mine Complex comprise 4.46 million tonnes at an average grade of 4.08 g/t Au containing 585,000 ounces of gold in the Measured and Indicated Resource category and 3.0 million tonnes at an average grade of 4.29 g/t Au containing 409,000 ounces of gold in the Inferred Mineral Resource category. The

Mineral Resources include the Roça Grande and Pilar mines. The estimates are based on the 2015 models, depleted for mining in 2016. Updates to the 2015 are in progress. A cut-off grade of 1.46 g/t Au was used to report the Mineral Resources for the Roça Grande Mine, and a cut-off grade of 1.93 g/t Au was used to report the Mineral Resources for the Pilar Mine.

**TABLE 10 SUMMARY OF MINERAL RESOURCES AS OF DECEMBER 31, 2016**  
**Jaguar Mining Inc. – Caeté Operations**

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
<b>Roça Grande Mine:</b>			
Measured	207	2.17	14
Indicated	937	2.95	89
<b>Sub-total M&amp;I</b>	<b>1,144</b>	<b>2.80</b>	<b>103</b>
Inferred	1,759	3.48	197
<b>Pilar Mine:</b>			
Measured	628	4.14	84
Indicated	2,687	4.62	399
<b>Sub-total M&amp;I</b>	<b>3,315</b>	<b>4.53</b>	<b>482</b>
Inferred	1,207	5.45	212
<b>Total, Caeté Operations:</b>			
Measured	835	3.65	98
Indicated	3,625	4.18	488
<b>Sub-total M&amp;I</b>	<b>4,460</b>	<b>4.08</b>	<b>585</b>
Inferred	2,966	4.29	409

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated by depletion of the 2015 year-end block models with 2016 excavations.
3. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au for the Roça Grande Mine and 1.93 g/t Au for the Pilar Mine.
4. Mineral Resources are estimated using a long-term gold price of US\$1,400 per ounce.
5. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reals: 1 US Dollar.
6. A minimum mining width of approximately 2 m was used.
7. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
8. No Mineral Reserves are currently present at the Roça Grande Mine. Mineral Resources are inclusive of Mineral Reserves for the Pilar Mine.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource estimates.

*Mineral Resource Estimates – Roça Grande Mine*

The updated block model for the Roça Grande Mine is based on drilling and channel sample data using a data cut-off date of June 30, 2015. The database comprises 649 drill holes and 6,517 channel samples. The estimate was

generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of one metre. The purpose of the minimum width criteria was to attempt to identify any areas of high grade mineralization that could be candidates for extraction using highly selective underground mining methods. A minimum width criteria was subsequently applied to the Mineral Resource reporting criteria by using a minimum grade times thickness product of 3 gram-metres. The gold grades are estimated using the inverse distance cubed interpolation (ID3) algorithm using capped composited assays. A capping value of 30 g/t Au was applied for the RG01 and RG06 Orebodies while a capping value of 50 g/t Au was applied for the RG02, RG03 and RG07 Orebodies. The Mineral Resources are reported using the gold grades estimated by the inverse distance cubed (ID3) method. The wireframe models of the mineralization and excavated material for the Roça Grande Mine were constructed using the excavation information as of December 31, 2015.

The mineralized material for each Orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with these orebodies.

A cut-off grade of 1.46 g/t Au is used for reporting of Mineral Resources. This cut-off grade was arrived at using a gold price of US\$1,400/oz, average gold recovery of 88%, and 2014 actual cost data for the Roça Grande Mine.

At a cut-off grade of 1.46 g/t Au, the Mineral Resources at the Roça Grande Mine comprise 1,144,000 million tonnes at an average grade of 2.80 g/t Au containing 103,000 ounces of gold in the Measured and Indicated Resource category and 1.759 million tonnes at an average grade of 3.48 g/t Au containing 197,000 ounces of gold in the Inferred Mineral Resource category. The Mineral Resources are presented in further detail in Table 11.

**TABLE 11 SUMMARY OF MINERAL RESOURCES BY OREBODY AS OF DECEMBER 31, 2016 – ROÇA GRANDE MINE**  
**Jaguar Mining Inc. – Caeté Operations**

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
<b>Orebody RG01:</b>			
Measured	177	2.25	13
Indicated	421	2.27	29
<b>Sub-total M&amp;I</b>	<b>598</b>	<b>2.27</b>	<b>42</b>
Inferred	300	2.92	28
<b>Orebody RG02:</b>			
Measured	-	-	-
Indicated	215	4.08	28
<b>Sub-total M&amp;I</b>	<b>215</b>	<b>4.08</b>	<b>28</b>
Inferred	756	3.91	95
<b>Orebody RG03:</b>			
Measured	-	-	-
Indicated	74	1.65	4
<b>Sub-total M&amp;I</b>	<b>74</b>	<b>1.65</b>	<b>4</b>
Inferred	365	2.58	30
<b>Orebody RG06:</b>			
Measured	29	1.63	2

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	184	3.16	19
<b>Sub-total M&amp;I</b>	<b>213</b>	<b>2.95</b>	<b>20</b>
Inferred	287	2.88	27
<b>Orebody RG07:</b>			
Measured	-	-	-
Indicated	42	6.55	9
<b>Sub-total M&amp;I</b>	<b>42</b>	<b>6.55</b>	<b>9</b>
Inferred	51	10.34	17
<b>Total Roça Grande Mine:</b>			
Total, Measured	207	2.17	14
Total, Indicated	937	2.95	89
<b>Total Measured &amp; Indicated</b>	<b>1,144</b>	<b>2.80</b>	<b>103</b>
Total, Inferred	1,759	3.48	197

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated at a cut-off grade of 1.46 g/t Au.
3. Mineral Resources are estimated using a long-term gold price of US\$1,400 per ounce.
4. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reals: 1 US Dollar.
5. A minimum mining width of approximately 2 m was used.
6. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
7. No Mineral Reserves are currently present at the Roça Grande Mine.
8. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
9. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource estimates.

It is RPA's opinion that the Roça Grande Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014).

*Mineral Resource Estimates – Pilar Mine*

The updated block model for the Pilar Mine is based on drilling and channel sample data using a data cut-off date of July 1, 2015. The database comprises 984 drill holes and 16,445 channels. The estimate was generated from a block model constrained by three-dimensional (3D) wireframe models that were constructed using a minimum width of two metres. The gold grades are estimated using the inverse distance cubed interpolation (ID3) algorithm using capped composited assays. Various capping values were applied to each of the different orebodies, ranging from 60 g/t Au for the BA Orebody to 10 g/t Au for the LHW Orebody. The Mineral Resources are reported using the gold grades estimated by the inverse distance cubed (ID3) method. The wireframe models of the mineralization and excavated material for the Pilar Mine were constructed using the excavation information as of December 31, 2015.

The mineralized material for each Orebody was classified into the Measured, Indicated, or Inferred Mineral Resource categories on the basis of the search ellipse ranges obtained from the variography study, the observed continuity of the mineralization, the drill hole and channel sample density, and previous production experience with this deposit.

A cut-off grade of 1.93 g/t Au is used for reporting of Mineral Resources. This cut-off grade was arrived at using a gold price of US\$1,400/oz, average gold recovery of 88%, and 2015 actual cost data for the Pilar Mine. Gold prices used for reserves are based on consensus, long term forecasts from banks, financial institutions, and other sources. For resources, gold prices used are slightly higher than those for reserves.

At a cut-off grade of 1.93 g/t Au, the Mineral Resources at the Pilar Mine comprise 3.315 million tonnes at an average grade of 4.53 g/t Au containing 482,000 ounces of gold in the Measured and Indicated Resource category and 1.207 million tonnes at an average grade of 5.45 g/t Au containing 212,000 ounces of gold in the Inferred Mineral Resource category.

The Mineral Resources are inclusive of Mineral Reserves. For those portions of the Mineral Resources that comprise the Mineral Reserve, the stope design wireframes were used to constrain the Mineral Resource reports.

The Mineral Resources are presented in further detail in Table 12.

**TABLE 12 SUMMARY OF MINERAL RESOURCES BY DOMAIN AS OF DECEMBER 31, 2016 – PILAR MINE**  
**Jaguar Mining Inc. – Caeté Operations**

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
<b>Orebody BA:</b>			
Measured	264	4.08	35
Indicated	168	5.29	29
<b>Sub-total M&amp;I</b>	<b>432</b>	<b>4.55</b>	<b>63</b>
Inferred	65	5.13	11
<b>Orebody BF:</b>			
Measured	217	4.32	30
Indicated	749	4.73	114
<b>Sub-total M&amp;I</b>	<b>966</b>	<b>4.64</b>	<b>144</b>
Inferred	293	6.77	64
<b>Orebody BF II:</b>			
Measured	4	4.46	1
Indicated	824	5.01	133
<b>Sub-total M&amp;I</b>	<b>828</b>	<b>5.01</b>	<b>133</b>
Inferred	198	7.89	50
<b>Orebody C:</b>			
Measured	80	4.24	11
Indicated	371	4.73	56
<b>Sub-total M&amp;I</b>	<b>450</b>	<b>4.64</b>	<b>67</b>
Inferred	140	5.10	23
<b>Orebody LFW:</b>			
Measured	58	3.68	7
Indicated	175	4.21	24
<b>Sub-total M&amp;I</b>	<b>233</b>	<b>4.08</b>	<b>31</b>
Inferred	117	4.87	18

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
<b>Orebody LHW:</b>			
Measured	-	-	-
Indicated	12	3.61	1
<b>Sub-total M&amp;I</b>	<b>12</b>	<b>3.61</b>	<b>1</b>
Inferred	5	3.11	1
<b>Orebody LPA:</b>			
Measured	6	2.72	1
Indicated	50	3.98	6
<b>Sub-total M&amp;I</b>	<b>56</b>	<b>3.85</b>	<b>7</b>
Inferred	-	-	-
<b>Orebody SW:</b>			
Measured	-	-	-
Indicated	338	3.28	36
<b>Sub-total M&amp;I</b>	<b>338</b>	<b>3.28</b>	<b>36</b>
Inferred	389	3.60	45
<b>Total Pilar Mine:</b>			
Total, Measured	628	4.14	84
Total, Indicated	2,687	4.62	399
<b>Total Measured &amp; Indicated</b>	<b>3,315</b>	<b>4.53</b>	<b>482</b>
Total, Inferred	1,207	5.45	212

Notes:

1. CIM definitions were followed for Mineral Resources.
2. Mineral Resources are estimated by depletion of the 2015 year-end block model with 2016 excavations.
3. Mineral Resources are estimated at a cut-off grade of 1.93 g/t Au.
4. Mineral Resources are estimated using a long-term gold price of US\$1,400 per ounce.
5. Mineral Resources are estimated using an average long-term foreign exchange rate of 2.5 Brazilian Reals: 1 US Dollar.
6. A minimum mining width of approximately 2 m was used.
7. Bulk densities used are either 2.89 t/m<sup>3</sup> for iron-formation poor domains or 3.05 t/m<sup>3</sup> for iron-formation rich domains.
8. Gold grades are estimated by the inverse distance cubed interpolation algorithm using capped composite samples.
9. Mineral Resources are inclusive of Mineral Reserves.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Numbers may not add due to rounding.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other factors that could materially affect the Mineral Resource estimates.

It is RPA's opinion that the Pilar Mineral Resource estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014).

*Mineral Reserve Estimates*

Table 13 summarizes the Mineral Reserves for the Pilar Mine as of December 31, 2016 based on a gold price of US\$1,150/oz. A break-even cut-off grade of 2.5 g/t Au was used to report the Mineral Reserves for the Pilar Mine. Mineral Reserves were calculated by depleting the mined excavations from the 2015 model.

Mineral Reserves have not been estimated for the Roça Grade Mine.

**TABLE 13 PILAR MINERAL RESERVES – DECEMBER 31, 2016****Jaguar Mining Inc. – Caeté Operations**

<b>Category</b>	<b>Tonnage (000 t)</b>	<b>Grade (g/t Au)</b>	<b>Contained Metal (000 oz Au)</b>
Proven	27	2.47	2
Probable	939	4.62	140
<b>Total</b>	<b>966</b>	<b>4.56</b>	<b>142</b>

## Notes:

1. CIM definitions were followed for Mineral Reserves.
2. Mineral Reserves are estimated at a cut-off grade of 1.90 g/t Au.
3. Mineral Reserves are estimated using an average long-term gold price of US\$1,150 per ounce and a US\$/BRL\$ exchange rate of 3.8.
4. A minimum mining width of approximately 2 m was used.
5. Bulk densities used are either 2.89 t/m<sup>3</sup> for iron-formation poor domains or 3.05 t/m<sup>3</sup> for iron-formation rich domains.
6. Numbers may not add due to rounding.

Dilution was addressed in two ways – internal, or planned dilution is included in the design solids where they extend beyond the resource wireframe. This occurs in order to respect minimum width for development, or to keep stope walls to achievable outlines. Additional volume included in this manner averages approximately 15% across the Mineral Reserves.

External, or unplanned dilution accounts for overbreak during blasting, minor ground failures in open stopes, and backfill mucked up from the floor of stopes. It was addressed by applying percentage factors to various excavation types, as listed in Table 14:

**TABLE 14 EXTERNAL DILUTION BY MINING METHOD****Jaguar Mining Inc. – Caeté Operations**

<b>Mining Method</b>	<b>Dilution (%)</b>
Raising	10
Development	20
Cut & Fill	8
Longhole Stopping	10

Total dilution included in reserves averages approximately 25%, which is a good match for measured results for 2014 mining. Results for 2015 were available for January to June, and show several months with much lower dilution results.

### *Cut-Off Grade*

Mineral Reserves were calculated using a break-even cut-off grade of 2.5 g/t Au, calculated using the following inputs:

- Gold price of US\$1,150/oz
- Exchange rate of US\$1.00:BRL\$3.8
- Metallurgical recovery of 89%
- Operating costs of BRL\$250 per tonne

Metal prices used for reserves match well with consensus, long term forecasts from banks, financial institutions, and other sources, and with prices used by major gold producers. Exchange rates are based on bank forecasts. Metallurgical recovery is in line with recent operating results, as are operating results.

An incremental cut-off grade of 1.9 g/t Au was estimated by splitting operating costs between fixed and variable, and using only the variable portions. This cut-off grade was used on development that had to be mined, and on a limited number of stopes around the edges of mining areas. A total of 17% of Mineral Reserves fall between break-even and incremental cut-off grades, an amount that RPA considers to be reasonable.

It is RPA's opinion that the Pilar Mineral Reserve estimates were prepared in a professional and diligent manner by qualified professionals and that the estimates comply with CIM (2014).

### *Mining Operations and Metallurgical Process*

The Caeté Gold Complex includes a processing plant at the Roça Grande Mine with a nominal capacity of 2,050 tpd, with separate tailings disposal areas for both fine flotation tailings and carbon-in-pulp (CIP) tailings.

The Roça Grande Mine recently produced approximately 500 tpd, however, management is currently reviewing its mining plans. Ore from Pilar Mine is transported by truck approximately 45 kilometres to the Caeté Gold Complex for processing.

At Pilar Mine, gold mineralization is contained within a shear zone with an average 50° to 60° dip. The mineralization is structurally complex due to intense folding and displacements (up to one metre) due to local faulting. This results in direction changes and pinching and swelling of the vein over relatively short distances. The ore zone hanging wall (HW) and footwall (FW) contacts are visible by eye though sampling shows that there is, on occasion, an assay wall within the formation. The orebody is approximately 250 metres to 350 metres along strike and the orebody is mined along strike access via cross cuts perpendicular to the orebody.

### *Mining Methods*

There are two mining methods in use. The cut and fill method is utilized in the narrower sections of the deposit whereas the longhole method is used in the thicker areas. The current LOMP forecasts longhole mining for a majority of the Mineral Reserves.

The mine is accessed from a five metre by five metre primary decline located in the footwall of the deposit. The portal is located at elevation 760 MASL. The mine is divided into levels with Level 1 established at elevation 690 metres. Starting at this point, the vertical clearance is 75 metres, i.e., Level 2 is at elevation 615 metres, Level 3 at elevation 540 metres, etc. A three-metre thick sill pillar is left between levels. Sublevels have also been excavated from the main ramp at 15 metres vertical intervals to provide for intermediate access to the mining panels. The decline has reached Level 7, a vertical depth of approximately 500 metres.



At each level and sublevel, drifts are developed near the centre of the mineralized zone to expose the FW and HW contacts. The drift is extended in both directions along strike, under geological control for alignment, continuing to expose the contacts until the limits of the deposit are reached. This provides for two working faces per sublevel.

Longhole mining is carried out on a longitudinal retreat sequence, towards the central access. Stopes are 50 metres in length and separated by three metre to five-metre-wide pillars, depending on the thickness of the zone. When the mining of each longhole stope has been completed, the excavation is filled using a combination of development waste and hydraulically placed cemented classified flotation tailings. A drainage bund is constructed using development waste to contain the backfill. The backfill is then placed in the mined-out excavation. Once the cement is allowed to set, the next stope in the sequence is drained of excess water and can be mined. The sequence continues until the entire sublevel is mined. Mining then proceeds upward to the next sublevel and the sequence is repeated until the sill pillar is reached. Stopes are mined from several individual levels simultaneously in order to provide the required number of active workplaces needed to meet production targets.

For cut and fill mining, the level development is carried out to the extent of the ore, then backfilled. Once drained of excess water and allowed to cure, the access drift is back-slashed to allow vehicle access to the top of the backfill elevation. The subsequent cut is advanced using the breasting technique. Mining progresses in two directions from the access towards the ends of the orebody. Drilling of the breasts is completed using two-boom electric-hydraulic jumbos equipped with extension steel. This configuration allows for the normal 3.5 m long rounds to be extended to seven metres. Mucking is performed using six cubic yard Load-Haul-Dump (LHD) units and haulage to surface is by a fleet of off-highway surface trucks varying in size from 10 t to 25 t. Initial access to each mining panel is from the main level (at the base of the panel). As mining progresses, a 20% slope ramp is constructed in the fill to provide access to the next cut above the previously placed backfill. As this internal ramp is constructed, the roof immediately above it is raised, maintaining a clearance of 4.2 metres. The excavation and backfill sequence is repeated until the next sublevel (15 metres above) is reached. The sequence is then repeated for a total of five sublevels until the next level is reached.

Backfill is sourced from the filtered coarse portion of the flotation tailings from the Caeté Mining Complex mill, supplemented with available development waste. The filtered tailings are backhauled using the same highway trucks used to transport the ore from the mine to the mill. The fill is re-pulped on surface prior to being pumped underground.

The mine is highly mechanized. Development and mining activities are accomplished with a fleet of five two-boom electric-hydraulic jumbos. Longhole drilling is completed with two Atlas Copco Simba drills. Three six cubic yard LHD units are used for mucking. A fleet of eight Iveco 25 t trucks and four 10 t trucks are used to haul broken rock to surface. This type of truck was designed for surface use and are often found to be insufficiently robust for underground use. Mechanical availability of these units can be lower than normally observed with haulage trucks specifically designed for underground mining applications.

Ground conditions were observed by RPA to be good. The main decline, portions of which were developed up to ten years ago, did not exhibit any roof or wall deterioration. Primary support in the mine is provided by the use of split sets, grouted rebar and, in the wider areas, grouted cable bolts. Two single-boom electric-hydraulic jumbos are used for rock bolting.

#### *Recovery Methods*

The Caeté processing plant has a design capacity of 720,000 tpa of run-of-mine (ROM) ore. In 2015, the plant processed feed from the Pilar and Roça Grande mines. Over the past five years of operation, the Caeté processing plant operated at approximately 84% of its design capacity. In 2015, this decreased to 65% due to lower ore production from the mines.

Following the completion of a number of modifications to improve the performance of the plant, the overall recovery achieved in 2015 was 89.5%, which was 0.5% higher than planned (89.0%) and an increase of 1.7% compared to 2014 (87.8 %). Gold recovery by flotation improved from 79.8% in 2014 to 85.5% in 2015.

The process flowsheet primarily consists of the following unit steps.

- Crushing
- Grinding
- Gravity Gold Recovery
- Flotation
- Leaching & Carbon-in-Pulp
- Gold Recovery
- Detoxification
- Tailings

The ore from the Pilar and Roça Grande Mines is transported by trucks to the crusher circuit and placed in the ROM stockpile. The crushing circuit is made up of a primary jaw crusher in open circuit, and secondary and tertiary cone crushers, operating in closed circuit.

The ROM stockpile ore is fed to the jaw crusher through a grizzly and vibrating feeder. The jaw crusher discharge feeds a multi deck screen, which feeds either the secondary or tertiary crushing circuit or the final product conveyor. The secondary cone crusher operates in closed circuit with a double deck screen. Product from the double deck screen either recirculates back to the secondary crusher, feeds the tertiary crusher, or goes to the final product conveyor. The tertiary cone crusher operates in closed circuit with a single deck scree, with the product recycling to the crusher or going to the final product conveyor, which goes to crushed ore stockpile. The final particle size of the crushing process is 16 mm.

#### *Grinding & Gravity Gold Recovery*

The grinding circuit consists of a horizontal ball mill with a capacity of up to 100 tonnes per hour, operating in closed circuit with a series of hydrocyclones. The overflow from the hydrocyclones (-200 mesh (74µm)) proceeds to the flotation circuit and the underflow (+200 mesh (74µm)) either feeds the gravity concentration circuit (75%) or is recycled to the ball mill feed (25%).

Gravity concentration at the Caeté plant uses a centrifugal gravity concentrator (Knelson) to recover fine particles of free gold. The gravity concentrate proceeds to an intense cyanidation plant (Acacia), from which the gold bearing solution is pumped directly to a dedicated set of electrolytic cells. The precipitate from the cells is sent to a refinery for further processing into doré gold bars.

The flotation circuit consists of a series of twelve (12) 500 cubic foot flotation cells, the first three operating as roughers, three operating as primary scavengers, three operating as secondary scavengers, and the last three operating as tertiary scavenger cells.

The concentrate thickener underflow slurry (40% solids w/w) is pumped to an agitated conditioning tank, where lime and cyanide are added, and then further pumped to a set of three agitated leach tanks operating by gravity, in series.

The four CIP tanks are designed to hold activated carbon in each tank through a designed screen which allows slurry to flow from tank to tank, but retains the carbon in each tank. The carbon interacts with the slurry, adsorbing the gold cyanide complex created in the leach tanks.

The gold loaded carbon is transferred to a desorption column. A hot solution (approx. 98° C) of caustic soda and 1% cyanide concentration is pumped upwardly through the elution column to remove or desorb the gold cyanide complex from the carbon.

After the desorption cycle, the sludge, steel wool, and cathodes are withdrawn and sent to the refinery for production of gold doré containing about 80% gold. The doré gold is then further refined, obtaining pure gold bars (minimum 99.99%).

#### *Environmental Studies and Permitting*

The mining title for the Pilar mine (claim 830.463/1983) initially belonged to the Companhia Vale do Rio Doce (VALE), which initiated the environmental licensing process in 1999 and obtained a preliminary license for the open-pit mining of the oxidized ore. Due to strategic changes of VALE, they decided at that time to cease progress at the mining project.

In 2003, Vale transferred the mineral rights to the MSOL who then took over the environmental licensing process for the implementation of the open pit mining project. Thus, MSOL obtained the Preliminary License, Construction License, and finally, the Operating License on June 27, 2006, through the COPAM process N° 00132/1999/003/2005.

In preparation for permitting of the underground mine, MSOL acquired a preliminary license for the activity by COPAM process 00132/1999/004/2007. SUPRAM issued the preliminary license on August 16, 2007 under certificate number 021/2007.

MSOL subsequently carried out the required environmental studies and submitted an application for a construction license under COPAM process number 00132/1999/006/2008. SUPRAM issued the construction license for the mining and processing of sulphide ores by the CIP-ADR process flowsheet on August 25, 2008 under certificate number 152/2008.

On September 22, 2009, MSOL applied for an operating license which was subsequently issued by SURPAM on June 30, 2010 under certificate number 153/2010, COPAM process 00132/1999/007/2009. On February 23, 2016, MSOL applied for a renewal of the operating license, COPAM process 00132/1999/009/2016, and the renewal application is currently under review.

Operating license LO 153/2010 is currently the only license relating to the Pilar Mine.

#### *Taxes*

Income taxes are 34% of taxable profit, including a 25% corporate tax rate and a 9% social contribution. In addition to direct operating costs, royalty payments and depreciation are deductible in determining taxable profit.

#### *Mine Life*

The current mine plan extends into 2019.

#### *Markets*

All gold produced at the Caeté operation is transported to São Paulo on a weekly basis for refining and sale at market prices.

### 3. Gurupi Project

In respect of the scientific and technical information contained in this AIF relating to the Company's Gurupi Project, (i) information up to January 31, 2011 is derived from the technical report titled "*Gurupi Gold Project Cipoeiro e Chega Tudo Properties Feasibility Study*", filed on SEDAR on January 31, 2011 (with an effective date of January 31, 2011), (the "Gurupi Feasibility Study"). The Gurupi Feasibility Study was prepared by Ivan C. Machado, MSc. P.E., P.Eng. of TechnoMine; (ii) information on updated Measured & Indicated Resources dated July 30, 2012 for the Gurupi Project has been prepared by or under the supervision of Leah Mach. Gurupi Mineral Reserves and Mineral Resources 2016 estimated were reviewed and approved by Geraldo Santos, BSc Geo., MAIG (CP) as the Qualified Person.

#### *Property Description and Location*

The Gurupi Project is located in the state of Maranhão, Brazil. MCT controls the Gurupi Project through a total of 32 mineral concessions totaling 137,419 hectares. The Cipoeiro and Chega Tudo deposits, which were the subject of a January 2011 feasibility study filed by Jaguar, are located in two of these 32 mineral concessions. No commercial production of gold has taken place on the Gurupi property.

The mineral rights (applications for mining concessions) in connection with the Cipoeiro and Chega Tudo deposits are in good standing.

The Cipoeiro and Chega Tudo deposits are located in an area that belongs to the National Institute of Colonization and Agrarian Reform ("INCRA"). Jaguar filed a request for release of land tenure from INCRA in February 2010. On December 28, 2010, INCRA issued a ruling that entitles Jaguar to start negotiations with landowners and settlers. Jaguar has carried out a socioeconomic evaluation in the area and completed a comprehensive resettlement project that has been well received by the landowners and settlers. INCRA had issued a memo in late 2013 rejecting Jaguar's first proposal with respect to land negotiations. Another feasibility study is underway with a lower impact mining method. Jaguar will submit a new proposal to INCRA for land easement based on this study.

In addition to statutory royalties based on gold production paid to the Brazilian government, Jaguar will be required to pay a 0.75% NSR to Rio Tinto Desenvolvidos Mineraiis Ltda. ("Rio Tinto") on gold production from six mineral concessions, including Cipoeiro. On December 28, 2012, Jaguar received notice that Rio Tinto had transferred its royalties rights to Vaaldiam Mining Inc.

Jaguar will also be required to pay a sliding scale NSR, which is based on gold price and covers 27 mineral concessions, including Chega Tudo, to Franco-Nevada Corporation ("Franco-Nevada") as follows:

<u>Scale of Franco-Nevada NSR</u>	
US\$/ounce	(%)
0-250	0.00
250-300	0.30
300-359	0.40
350-400	0.75
>400	1.00

#### *Accessibility, Climate, Local Resources, Infrastructure and Physiography*

The Gurupi Project is accessed via the Maracaçumé - Chega Tudo village road, a single lane municipal dirt road. A paved highway, which connects São Luís to Belém, is located approximately 60 kilometres from Gurupi. The international airport of Marechal Cunha Machado is located in São Luis, the state's capital located 500 kilometres to the northeast of the Gurupi Project. The city of Belém, which is located 383 kilometres from the Gurupi Project, has an international airport with direct daily flights to the United States. There is a small airstrip for light passenger

aircraft near the town of Maracaçumé. The São Luis port receives about 50 ships per month and is equipped to handle supplies for the project. Skilled labor is expected to be available upon commencement of mining operations.

The climate is equatorial, dry in winter and with a rainy period in summer (December to May). Average monthly temperatures range from 25.8°C in March to approximately 27.4°C in October and November. Temperature extremes range from 17.2°C to 37.7°C. Rainfall in the area can range between 1,200 mm and 3,200 mm, averaging 2,000 mm. Climate conditions permit year-round mining operations. Exploration field seasons are usually limited to the dry season as activities can be dependent on rainfall intensity.

The terrain surrounding the deposits is adequate for construction of all required facilities, including administration, camp, mine, plant, tailings and rejects, and waste rock disposal facilities. Power to the project site is currently supplied by the local utility company CEMAR.

Fresh water to the future plant will be provided by the Gurupi River, which is about 14 kilometres from the future plant site. A water treatment system will be installed at the plant site to provide proper potable water supply.

The physical relief in the project area varies from virtually flat to low rounded hills with about 30 meters of relief. Secondary-growth tropical bush and open grass lands cover the vast majority of the area. Most of the area adjacent to the site is used for cattle ranching, farming and logging activities. Chega Tudo and Cipoeiro areas are crossed by small intermittent streams and have rural villages on the margins of the northern extent of the mineralization.

### *Licensing*

On December 2, 2009, Jaguar acquired 100% of MCT, which holds all of the mineral licenses for the Gurupi Project, from an indirect wholly-owned subsidiary of Kinross Gold Corporation ("Kinross"). Jaguar satisfied the US\$39 million purchase price for MCT by issuing 3,377,354 common shares in the capital of Jaguar to Kinross, representing approximately 4.07% of Jaguar's outstanding common shares (on a non-diluted basis) as of the date of the acquisition. Shortly thereafter, Jaguar commissioned AMEC to prepare a prefeasibility study to identify cost-saving areas and to identify additional requirements for a feasibility study. AMEC's prefeasibility study was completed in May 2010. Subsequently, Jaguar commissioned TechnoMine to conduct the Gurupi Feasibility Study, which was completed in January 2011.

During 2011, Jaguar continued with the work for environmental licensing of the Gurupi Project. Jaguar received the Preliminary License ("LP") in June 2011. After the LP was granted, Jaguar completed part of the detailed engineering required to obtain the Installation License ("LI"). In January 2012, Jaguar received the LI, which authorizes the construction of Gurupi's processing plant. The licensing decision for the tailings impoundment facility for the project is pending subject to the acquisition by Jaguar of the surface land rights for their construction. At this time Jaguar has been advised by the State of Maranhão Environmental Authority that it was served by the State. Jaguar has become aware that on November 20, 2013, the Public Prosecutor in Brazil filed a lawsuit against MCT claiming that: (i) MCT should be classified as a "foreign company", and therefore be completely restricted from carrying on operations in Brazil and, in particular, at the Gurupi project; (ii) there are purported irregularities in the environmental licensing, mainly as the installation license granted to MCT covers only a fraction of the area in which MCT will operate; and (iii) there is no agreement with the National Institute of Colonization and Agrarian Reform ("INCRA") for MCT's surface rights, which surface rights include an area in which there is a settlement of inhabitants that will be affected by the proposed project.

The Public Prosecutor asked for an urgent (preliminary) decision from the Court claiming that if MCT activities continued, it would be prejudicial to the State of Maranhão. Typically, this kind of decision can be granted without hearing from the defendants, in this case, MCT.

During the fourth quarter of 2015, Jaguar was formally notified about this injunction. The appeal of the injunction was filed in Q1 2016 as required by the law. The main point of the injunction is that MCT wants to develop a mine

on land that was designated as an agricultural settlement project by INCRA. However, the mineral rights for the region are from the 1980's and 1990's, while INCRA established an "Agricultural Settlement" in 2005. Mineral production under the National Department for Mineral Production ("DNPM") has the same level of importance as agricultural development under Brazilian law.

The main part of Jaguar's defense against the injunction is that there is very little to no agricultural work occurring in the areas of Chega Tudo and Cipoeiro and only large scale "garimpeiro" (illegal artisanal miners) mining is being carried out. In FY 2015, DNPM officially published information regarding eight mineral rights belonging to Jaguar. This publication will require Jaguar to complete mineral exploration and deliver a final exploration report to the DNPM within three years. Failure to identify and report mineralization during this period may likely result in a loss of these mineral rights.

During 2016, Jaguar continued the detailed planning for the resumption of limited mineral exploration in order to retain its mineral rights and also continued its interactions and engagement with stakeholders at Gurupi, including senior national government officials and ministries. Discussions have been positive and officials appear supportive of advancing economic activity, including mining, in Maranhão. Meetings with INCRA in Maranhão are ongoing and are critical to resolve the land issues surrounding the project area.

In Q3 2016, Jaguar supplied the municipality of Centro Novo do Maranhão with the preparation of the Municipal Development Plan that should be used to guide the growth and the proper exploration of the potential economic and social opportunities of the municipality.

In accordance to the earn-in agreement with Avanco Resources Limited ("Avanco"), which was signed in Q4 2016 (refer to page 68 for more information on the Gurupi Earn-in Transaction), Avanco is now conducting the conversations with INCRA and the environmental licensing process. The exploration program is also under Avanco's management. In Q1 2017, INCRA agreed to send a technical team to Chega Tudo and Cipoeiro to assess the local settlement and presence of "garimpeiros". The visit by the INCRA team is expected to occur in the first half of 2017. A specialized Brazilian company has been retained to develop the research of a socioeconomic study and prepare a final report to be delivered for INCRA.

### *History*

Gold was first discovered in the project area in the 17<sup>th</sup> century by colonial settlers. During the early 1900s and again in the mid-1980s, intermittent small-scale production took place as part of a region-wide rush of artisan miners, known in Brazil as garimpeiros. Gold was mined from oxidized weathered material, including alluvium, saprolite, and saprolite-hosted quartz veins, mostly from open pits limited to about 40 metres in depth. Underground excavations have been of much lesser importance. Historical records do not exist. However, the production of about 200,000 ounces of gold has been estimated over the past century or so through these small-scale efforts.

CNM Companhia Nacional de Mineração Ltda. ("CNM"), a wholly-owned subsidiary of TVX Gold Inc. ("TVX"), commenced exploration in the project area in 1994. Later that year, a joint venture between TVX and Santa Fe Pacific Gold Corp. ("Santa Fe") was established.

CNM first drilled the Chega Tudo deposit by targeting the known *garimpo* pits in the vicinity of the Chega Tudo village. At Cipoeiro, mineralization was first drilled in late 1996 following the onset of *garimpeiro* activity. From 1994 to 1997, exploration work programs comprised soil, saprolite, rock chip and channel sampling, information acquisition from airborne-photogrammetry programs, topographic data generation, ground magnetic geophysical surveys, reconnaissance geological mapping, airborne magnetic and gamma-ray surveys, core and reverse circulation (RC) drilling and metallurgical testwork.

In 1997, Newmont purchased Santa Fe and assumed control of the project. Between 1997 and 2000, Newmont conducted exploration work, including geological mapping, geochemical sampling, airborne electromagnetic ("EM")

survey, ground magnetic and induced polarization (“IP”) surveys, diamond drilling and RC drilling, core re-logging program, metallurgical testwork with a strong focus on comminution indices, construction of geological models and estimation of mineral resource grades and tonnages.

In 1999, TVX entered into a strategic business partnership with Normandy Mining Ltd. (“Normandy”), forming TVX Normandy Americas, which controlled the project. In 2002, Newmont acquired Normandy. As a result, TVX Normandy Americas became 49.9% owned by Newmont and 50.1% owned by TVX.

In 2003, TVX purchased Newmont’s interest in TVX Normandy Americas for US\$180 million. Also in 2003, TVX, Kinross and Echo Bay Mines Ltd. (“Echo Bay”) merged and the resulting entity, Kinross, took ownership control of the project.

Kinross completed infill and definition core drilling programs at the Chega Tudo and Cipoeiro targets, metallurgical testwork, and bulk and solids density determinations. In 2005, an unpublished feasibility study was commissioned and completed by AMEC. The AMEC feasibility study envisioned mining to be performed by conventional open pit techniques, while the process route considered a primary crushing, semi-autogenous grinding mill, ball milling and a stripping and EW plant following a leaching-CIP circuit.

From 2006 through 2008, Kinross resumed mineral exploration with the intention of investigating other potential targets that could increase mineral resources.

In 2009, Jaguar entered into negotiations with Kinross to acquire the project and commissioned PAH to conduct a review of mineral resources, which was completed in early December 2009.

#### *Geology and Mineralization*

The Gurupi Project area lies within an elongate northwest–southeast-trending shear zone developed along the boundary between a Lower Proterozoic metamorphic belt (Gurupi greenstone belt) and the southwestern margin of the Archaean São Luis craton. Most of the gold deposits and showings of the Gurupi greenstone belt, including Chega Tudo and Cipoeiro, are hosted in structures associated with the strike-slip, sinistral Tentugal shear zone. The project deposits are considered to be typical of mesothermal vein-style, or orogenic-style gold deposits.

Chega Tudo is hosted in a dacite metavolcanic unit. Intrusive gabbro, extrusive andesite, and arkosic arenite rocks are in structural contact with the dacite. Rocks in the deposit area have been widely affected by hydrothermal alteration. Mineralization is emplaced mainly in dacite and found solely within zones of quartz–sericite–pyrite alteration and is closely related to the amount of pyrite introduction. Typically, mineralization forms en-echelon pods elongated with the shear foliation and persisting for tens to hundreds of meters of strike and a similar distance down dip. These northwest-trending, steeply southwest-dipping mineralized zones range from a few metres to as much as 30 metres in width and can form multiple pods that can be as much as 100 metres wide.

Two main litho-types are recognized at Cipoeiro, a tonalite and an arkosic fine-grained arenite with thin quartz–pebble conglomerate layers. The primary mineralization is hosted by a coarse equigranular intrusive of tonalitic composition. The hydrothermal system at Cipoeiro was chemically similar to Chega Tudo’s. Silica flooding and replacement of the tonalite is more intense and more widespread than seen in the metavolcanics at Chega Tudo. However, gold remains most closely associated with sulfide (pyrite) introduction and quartz–sericite alteration. Two zones of mineralization have been defined, the Contact Ore Zone on the south and the Blanket Ore Zone to the north. The zones are separated by the Central Fault Zone (CFZ).

#### *Exploration*

TVX, Santa Fe, Newmont and Kinross conducted exploration activities on the Gurupi Project, including the acquisition of an airborne photogrammetry base, topographic data, reconnaissance, regional and detailed geological mapping,

soil, saprolite, rock chip and channel sampling, ground and airborne geophysical surveys, reverse circulation (“RC”) and diamond drilling, mineralization characterization studies and metallurgical testing of samples. Petrographic, fluid inclusion, stable isotope studies, and density measurements on the different lithologies were also carried out.

During 2004, Kinross performed a two-meter resolution topographic survey of the garimpeiros’ pits. Topography was checked based on field surveys completed by licensed Brazilian surveyors using modern survey instruments. The field surveys confirmed the current limits of the garimpeiros’ pits in the topographic surface.

Regional and detailed geological mapping was completed in several phases. Map scales varied from regional (1:50,000) to local (1:500). Regional scale mapping was based on a photogrammetry base; prospect-scale mapping used grids for control. Map results were used to identify areas of quartz veining, alteration, and sulfide outcrop that warranted additional work. Interpretation of air photos was used to vector into areas that required more detailed geological mapping and sampling.

Soil, saprolite, rock chip and channel sampling were used to evaluate mineralization potential and generate targets for RC and diamond drilling. A total of 42,024 soil, rock chip and saprolite samples were taken, primarily in areas of known garimpeiros workings. Channel sampling of the garimpeiros pits and excavations totalled 6,277 samples.

Airborne geophysical surveys, comprising magnetic, radiometric and EM data acquisition, treatment, and interpretation were used to vector into mineralization and generate targets for drilling programs. Surveys were performed by contract expert geophysical firms. The airborne magnetic and radiometric survey covered about 10,180 line km, in an area of about 1,900 km<sup>2</sup>. The EM Survey covered an area of about 497 km<sup>2</sup>, corresponding to approximately 2,655 line km. Airborne geophysical anomalies were checked on the ground using ground geophysics magnetics and Induced Polarization (“IP”) surveys.

Ground surveys were performed by Newmont and Kinross personnel. Ground magnetic surveys were performed at Chega Tudo, covering 43 line km in an area of approximately 10 km<sup>2</sup>. A total of 64 line km of IP surveys were completed at Cipoeiro and Chega Tudo, covering a total area of 22 km<sup>2</sup>.

Geophysical surveying has been effective in mapping sulfide mineralization that could include gold mineralization associated with regional structural trends and associated splay structures.

The Brazilian Geological Service (“CPRM”) undertook detailed geological, mineralogical, isotopic and age-dating studies on the Gurupi Belt, which included generating chemical data for hydrothermal chlorites and stable isotope (O, H, C, S) compositions of silicate, carbonate and sulfide minerals from the Chega Tudo and Cipoeiro deposits. These chemical and isotopic results, in addition to field, structural, and petrographic information, enabled the CPRM staff participating in the studies to discuss petrogenesis-related variables of the Cipoeiro and Chega Tudo deposits, including temperature and redox conditions of mineralization, as well as possible sources for fluids and metals.

Such data have a major influence on metallogeny models for exploration, and therefore on exploration program layouts.

Five mineralization samples were examined using scanning electron microscopy to aid in gold mineralogy determinations. The results were used to define the Project’s mineralogy.

### *Drilling*

Drilling on the Project has consisted of 448 core holes over 67,940.70 metres and 258 RC drill holes over 27,518.66 metres for a total of 706 holes drilled over 95,495.36 metres.



The RC holes were drilled using 3.5-inch (88.9 millimeters) rods with a nominal 4.5-inch (114.3 millimeters) diameter hole. RC samples were collected at regular one meter intervals in plastic bags at the sample cyclone. The entire sample was then transported back to the field sample preparation facility for drying, splitting and preparation.

Core diameters are consistently HQ (63.5 millimeters) diameter core from surface through the saprolite to bedrock. At depths of about one metre to three metres into bedrock the holes were reduced to NQ (47.6 millimeters) diameter to the final hole depth.

Core was transferred to wooden core boxes and brought to the Project core processing facility where it was photographed, logged for geological and geotechnical information, and sampled. Transportation of core boxes to the Newmont-built, well-organized and well-maintained core shed was done by the drilling company personnel or the drilling supervisor.

Logging of RC drill cuttings and core utilized standard logging procedures. Initial logging utilized paper forms, with manually-entered data into a database from the form.

Samples were geologically logged with a system for identifying lithologies, alteration assemblage, degree of ductile shearing, quartz veining, and sulfide content. Kinross added geotechnical logging to the program in 2003.

In 1998, Newmont relogged the drill core and select RC hole samples from Cipoeiro. The relogging focused on identifying and coding into a drill core sample database some key features associated with the mineralization, including sulfide percent, quartz-sericite alteration and shear foliation.

Drill cores were photographed prior to splitting and a photographic record is kept of all drill hole and core logs.

Drill hole collar coordinates were gathered during the 1990s drilling campaigns using hand-held GPS instruments.

Drill collars for the 2003 to 2008 drill holes were surveyed prior to the rig occupying the site and after completion of the hole. Surveys were performed using digital GPS and Total Station instruments. Only the final completed hole survey was used in the project database.

Down-hole surveys of core holes have been performed using Ezy-shot and Tropari instruments. RC holes were not typically down-hole surveyed.

Detailed measurements of core recovery have been routinely recorded on geological logs for virtually all the core holes.

Tonalite and dacite recoveries generally exceeded 95%. Although in near-surface, saprolitic material core recovery varied considerably, the overall recovery consistently exceeded 85% to 90%.

Drill holes have been drilled on oblique northeast–southwest 50-metre drilling fences, with holes drilled at 50-metre intervals along these sections.

At Chega Tudo, the majority of drill holes have angles between 40° to 60° to the southwest; however, due to restrictions on drill hole collar locations in areas close to Chega Tudo village, some drill holes were directed to the northeast. Several holes have been directed in slightly varied orientation to the fences. Mineralization at Chega Tudo typically dips approximately 80°SW with a true thickness of 10–50 metres, comprising individual “lodes” ranging in thickness from 2–20 metres.

Drill holes within the Chega Tudo deposit are based on a grid line that has a baseline with a northwest–southeast orientation. Sections along the base line have irregular spacings, ranging from 25-80 metres. Drill holes are spaced

along the lines at 30–60 metre spacings. Drilling that supports estimation comprises 42 RC holes over 3,426 metres and 83 core holes over 11,727 metres.

The majority of drilling directed at the Contact Zone mineralization within Cipoeiro has a 60° angle to the southwest. The drilling directed at the Blanket Zone has a variety of angle due to the varying dip of the deposit. Almost all of the drilling is directed to the southwest. At Cipoeiro, the Contact Zone dips to the NE at approximately 45° to 60°, while the Blanket Zone has a variable dip to the south between 10° to 50°.

The Cipoeiro drill holes fall within two drilling grids. The first grid, covering an area of 2,450 metres by 380 metres within the Contact Zone, has a base line that is oriented north–northwest–south–southeast. Section lines within the grid are irregular; line spacings range between 50 metres and 100 metres. Drill holes are typically spaced at 50 metres along the lines. The second grid covers the Blanket Zone and covers an area of about 1,100 metres by 600 metres. The grid base line has a north–northeast–south–southwest alignment. Section lines are spaced irregularly along the baseline, varying from 60 metres to 90 metres. Drill hole spacing along the lines ranges from 40 metres to 80 metres. Drilling that supports estimation comprises 40 RC holes over 4,086 metres and 124 core holes over 19,164 metres.

Between the third quarter of 2011 and the second quarter of 2012, Jaguar conducted a comprehensive diamond drilling campaign at the Chega Tudo and Cipoeiro deposits within the Gurupi Project. A total of 24,497 metres were drilled in 107 holes for 19,655 samples recovered. The drill results confirmed the extension of the mineralization to a depth of over 350 metres below surface at Chega Tudo and over 300 metres depth at Cipoeiro. Previous drilling programs, which included a total of 75,233 metres drilled in 543 holes, had confirmed the mineralization to depths of approximately 130 metres at Chega Tudo and 170 metres at Cipoeiro. Gold mineralization at both the Chega Tudo and Cipoeiro deposits remains open at depth.

Based on analysis of the recent drilling results, Jaguar increased its estimated Measured and Indicated Mineral Resources at its Gurupi Project by 40% to 3.52 million ounces of gold. The mineral resources, stated at a cut-off grade of 0.21 g/t Au, include 46.66 million tonnes of Measured Mineral Resources at 0.72 g/t Au and 95.98 million tonnes of Indicated Mineral Resources at 0.79 g/t Au, in total of 142,636,280 tonnes of Measured and Indicated Mineral Resources at 0.77g/t and 3,519,410 ounces of gold. The cut-off grade of 0.21 g/t Au was based on \$1,500/ounce gold price.

Work on a revised feasibility study for the development of the Gurupi Project has been delayed indefinitely as Jaguar continues to focus on completing the restructuring and implementation of the production programs at its operations in Minas Gerais.

While the Company has focused recent drilling and exploration on the Chega Tudo and Cipoeiro deposits, the Gurupi concession includes 12 additional identified targets in 32 contiguous mineral rights totaling 138,548 hectares. These additional targets have not been included in any of the Company's Mineral Resource estimates or feasibility studies related to the Gurupi Project to date. These targets have been identified by favorable geology, structures, old artisan mine works, soil and channel sampling anomalies and exploration drilling, and represent the potential for further increases in mineral resources at Gurupi.

During the third quarter of 2012, Jaguar completed infill and extensional diamond drilling carried out over a 900-metre (along the strike) mineralized sector of one of the 12 additional targets mentioned above. This target, known as the Mandiocacal Target, is located approximately one kilometre NW of Gurupi's Chega Tudo deposit and represents the extension of its mineralized structure. The drilling results, in addition to results obtained by drilling performed by the previous owners, confirm the deposit mineralization extend to the NW. Such 12 new targets have not yet been included in the Company's mineral resource estimates or feasibility studies related to the Gurupi Project to date. The Company anticipates that these additional targets have the potential to further increase mineral resources at Gurupi.

### *Sampling and Analysis*

In 1996, Santa Fe established a sample preparation facility at the project site to handle the core, RC, and surface geochemical samples collected during exploration programs managed by Santa Fe and later Newmont. Company personnel were responsible for sample preparation from 1996–2000.

There is no record of the analytical laboratories prior to 1996.

Core, RC, and surface geochemical samples (from the Santa Fe and Newmont programs (1996–2000) were dispatched to Nomos Análises Minerais Ltda. (“Nomos”) in Belo Horizonte, Brazil. Samples generated by Kinross exploration and delineation drilling programs between 2003 and 2008 were prepared and analysed by Lakefield–Geosol Laboratories (Lakefield), also in Belo Horizonte.

Lakefield is independent of Kinross, and was ISO-certified at the time of analysis. Lakefield was acquired by the SGS Laboratory Group during 2004.

Check sampling has been undertaken by ALS Chemex, Bondar Clegg and Cone Laboratories.

Bondar Clegg was an independent, ISO-certified laboratory group that was acquired by ALS Chemex in 2001. The ALS Chemex laboratories maintain independence and ISO certification. Cone Laboratories certification at the time of analysis is unknown.

Extensive documentation for the sample preparation by Santa Fe and Newmont at the on-site laboratory preparation facility was reviewed for the purposes of the in-house AMEC 2005 feasibility study. Methods utilized conform to standard industry practices.

Drill samples were crushed to minus 10 mesh; then a two kilogram split was pulverized to a nominal 90% passing 150 mesh using a ring pulverizer. An assay split of 250 grams was collected from the pulp and shipped to Nomos for a 50-gram fire assay digestion, and AA determination for gold. Results greater than 10.0 g/t Au were re-assayed with a gravity finish.

Kinross’ diamond core samples were prepared and assayed at Lakefield’s Belo Horizonte laboratory. The sample preparation and assay procedures were similar to those used by Santa Fe and Newmont.

Samples were crushed and pulverized in their entirety to 95% passing 150 mesh using a ring pulverizer. A 250-gram sample pulp was then collected for analysis. Lakefield employed the same 50-gram fire assay digestion and subsequent AA determination method to complete each analysis.

Blank control samples were typically inserted into the sample stream. Review of the blank results performed by AMEC in 2005 indicated that the sample preparation process was free of contamination.

Entry of information into databases utilized a variety of techniques and procedures to check the integrity of the data entered. The current Project database is in MS Access. Geological data from early drilling programs were entered into spreadsheets in a single pass. Assays were received electronically or by disc from the laboratories and imported directly into the database. Drill-hole collar and down-hole survey data were manually entered into the database.

Data were verified prior to geological modeling and mineral resource estimation by means of in-built program triggers within the software. Checks are performed on surveys, collar co-ordinates, lithology data, and assay data.

Documentation for the pre-Kinross programs is generally available, but not comprehensive. Typically, geological logs, and analytical data are preserved for all drill holes; however, collar data is partially missing.

Paper records were kept for all Kinross assay and QA/QC data, geological logging and density information, downhole and collar coordinate surveys. All paper records were filed by drill hole, for quick spotting and retrieval of any information desired. Assays, downhole surveys, and collar surveys were stored in the same file as the geological logging information. In addition, sample preparation and laboratory assay protocols from the laboratories were monitored and kept on file.

Assay pulps and crushed reject material are stored off-site. Core is stored in wooden core boxes on steel racks in the buildings adjacent to the core logging and cutting facilities. The core boxes are racked in numerical sequence by drill hole number and depth.

#### *Security of Samples*

During the 2003–2004 and 2007–2008 periods of Kinross drilling programs, cores were kept at the drill rig until the end of each shift. They were then delivered to the logging facility and placed on benches for photography and logging. The core was typically sawed and sampled within a three-day period. During the various stages of this process, the access to the core was available to assigned drill crew, supervisors and project staff.

Sample sacks were typically accessible to a limited number of transportation personnel during shipment of samples to Belo Horizonte. Chain of custody procedures consisted of filling out sample submittal forms that were sent to the laboratory with sample shipments, to assure that all samples were received by the laboratory.

#### *Mineral Resource and Mineral Reserve Estimates*

As of December 31, 2016, the Gurupi Project has an estimated 142,636,280 tonnes of Measured and Indicated Mineral Resources at an average grade of 0.77 g/t Au totaling 3,519,410 ounces of gold and 7,719,290 tonnes of Inferred Mineral Resources at an average grade of 0.66 g/t Au totaling 165,340 ounces of gold.

Probable gold mineral reserves, which are included in the reported Mineral Resource estimate, are estimated at 63,756,700 tonnes at an average grade of 1.14 g/t Au totaling 2,327,930 ounces. Mineral Reserve estimates are based on TechnoMine’s 2011 feasibility study and do not contemplate the 2012 Mineral Resource increase as per estimates for the Gurupi Project carried out by Ms. Leah Mach from SRK.

#### *Environmental Licensing*

Please refer to section General Development of the Business – Gurupi Project – Licensing section for most recent updates on environmental licensing for the project.

As mentioned above, the ongoing discussion with INCRA and the recognition by this agency itself of the real condition and use of the area by “garimpeiros” will be an important step to move forward on licensing process.

#### *Summary of Project Economics*

In accordance with the 2011 TechnoMine feasibility study, the adopted gold price for the Gurupi Project base case scenario is US\$1,066 per ounce of gold average for the LOM. The Project’s estimated non-discounted “monetizable” (salable) total gold production is 1,932,920 ounces of gold, which would yield total non-discounted gross revenue of US\$2,060.5 million. Based on a 13-year LOM, the average annual gross revenue would amount to US\$158.5 million. Below is a summary of the Project economics.

ROM total tonnage:	63,756,700 tonnes
ROM total contained gold:	2,327,930 ounces
Mill Feed Grade (LOM average):	1.10 grams per tonne
Mining Rate:	4,000,000 tonnes in 2013

	4,500,000 tonnes in 2014
	5,000,000 tonnes yearly from 2015 to 2021 5,200,000 tonnes in 2022
	5,256,700 tonnes in 2023
	4,900,000 tonnes yearly from 2024 to 2025
ROM average “cruise” production:	13,890 tonnes per day
Metallurgical recovery:	85.6%
Total gold production:	1,932,920 ounces of gold
Gold average annual production:	148,690 ounces per year
Project life (LOM):	13 years
CAPEX (total):	US\$345.7 million (straight)
Average cash cost:	US\$445 per ounce of gold
Average full-loaded cash cost:	US\$676 per ounce, including invested capital
Start of production:	First quarter of 2013
Exchange rate construction period	US\$1.00 = R\$1.80
Exchange rate over LOM	US\$1.00 = R\$1.90

Depreciation and amortization have been prorated over the Gurupi Project mine life. The cumulative operating profit has been estimated at US\$1.1 billion. The after-tax cumulative profit estimate is US\$985 million and the cumulative net cash flow estimate is US\$640 million.

#### *Mining Operations and Metallurgical Process*

In accordance with the 2011 TechnoMine feasibility study, the mining method to be used in the Gurupi Project will be open pit. The saprolite zone will be mined by hydraulic excavator and the bedrock will require drilling and blasting. Haul roads and in-pit ramps are designed at 10% gradient and with a width of 22 metres, based on approximately three and half times the width of a Caterpillar 777 haul truck (approximately 6.1 metres). This will provide sufficient width for two lanes of traffic and also allows space for a drainage ditch and safety berm.

The water management system deals with the drainage of the spring and rain water on the open pit, waste dump areas, process plant area, tailings basin area and on the Chega Tudo to Cipoeiro haul road.

Mining equipment selection was based on the use of diesel-powered, rigid-framed haul trucks, front-end loaders and excavators.

A mine schedule was developed for the three pits, one at Chega Tudo and two at Cipoeiro, based on an assumption of three eight hour shifts per day, seven days per week. The mine schedule was stated using a ten metre operational bench height and ore zones within each of the pits interpreted as being continuous. This allows flexible sequencing of ore and waste as required for mill feed. The ore and waste quantities in the schedule were reported separately for both the saprolite and bedrock material types.

Mining is planned to commence in the Cipoeiro region due to the higher-grade ore in those pits. Chega Tudo mining is scheduled to be initiated during Year 8. Mining will be gradually introduced at Chega Tudo to reduce the impact on the trucking requirements.

The host rock at Cipoeiro is Tonalite, while Dacite is the host rock at Chega Tudo. Dacite will be processed starting in 2020. The mineral processing route will consist of the following sequence of operations:

Concentration: 100% of the total mill feed (solids of tonalite and transition ore) and 100% of the total feed to the saprolite scrubbing and classification plant – no cyanide addition.

- Crushing and screening, including HPGR as tertiary crusher;

- Grinding, cycloning, and thickening;
- Flotation and continuous discharge gravity concentration of the flotation rejects;
- Rejects cycloning and thickening plant fed by the gravity circuit rejects (about 82% of the total mill feed - solids);
- Regrinding, cycloning and thickening of the flotation concentrate;
- Sapolite scrubbing and classification plant.

CIP Plant: 18% of the total mill feed (solids) and 100% sapolite mill feed (solids) – cyanide addition.

- Hydrometallurgy - via a conventional leaching and ADR CIP process of the reground/thickened flotation concentrate and sapolite ore feed. Recovery will be performed by an EW circuit, after elution (desorption; stripping) of the CIP loaded carbon;
- Cyanide destruction plant for the CIP tailings pulp.

The adopted overall metallurgical recovery (flotation/gravity separation/leaching/ADR) is 85.6%. The metallurgical recovery was adopted based on testwork carried out by SGS Lakefield, Canada and Knelson Research & Technology Centre – Langley, BC, Canada.

#### *Taxes*

Income taxes are 24% of taxable profit, including a 15% corporate tax rate and a 9% social contribution. In addition to direct operating costs, royalty payments and depreciation are deductible in determining taxable profit.

#### *Gurupi Avanco Earn-in Transaction*

On October 4, 2016, the Company announced that it has entered into an earn-in agreement (the "Agreement") with Avanco Resources Limited ("Avanco"), pursuant to which Avanco may earn up to a 100% interest in the Gurupi Project. Upon the satisfactory completion of certain closing conditions, the Agreement provides Avanco with the right to earn 20% of Jaguar's interest in the Project by paying to Jaguar an aggregate cash fee of \$1.7 million plus an additional fee of \$500,000 in cash or shares of Avanco, and by expending a minimum of \$300,000 on permitting and access in respect of the Project. Avanco will earn an additional 31% interest in Gurupi upon the publication of a JORC compliant reserve estimate in excess of 500,000 ounces, and will earn a further 29% interest in Gurupi upon demonstration of adequate funding coupled with the start of construction of a process plant with capacity in excess of 50,000 ounces per year. In the event that Avanco cannot demonstrate adequate funding for the Project, Jaguar will have a one-time right to buy-back a 31% interest in Gurupi and control of the Project by paying to Avanco the reasonable costs and expenses incurred in the preparation of the JORC compliant reserve estimate and technical studies. Avanco will have the option to acquire the remaining 20% interest in the Project at any time by paying a fee equal to the greater of \$6.25 million or the sum of \$12.50 per ounce of gold as per the JORC compliant reserve estimate.

Pursuant to the Agreement, Jaguar will retain a Net Smelter Return ("NSR") royalty ("Royalty") upon the commissioning of production at the Project. The Royalty will be 1% NSR on the first 500,000 ounces of gold or gold ounce equivalents produced; 2% NSR on production from 500,001 to 1,500,000 ounces of gold or gold ounce equivalents; and 1% NSR on production exceeding 1,500,000 ounces of gold or gold ounce equivalents.

## Non-Material Mineral Properties

### 1. Paciência Mining Complex

The Paciência mining complex consists of an underground mine (Santa Isabel) and a CIP processing plant (the “Paciência Plant”). The Paciência Plant was commissioned in April 2008 and commercial production was declared in December 2008 and has been placed on care and maintenance since 2012.

The well-built facilities remain functional. However, it is clear that, based on the defined resources, the underground mine cannot support a start-up of the facility at this time. To restart operations, the Company would need to identify sufficient feed for a sustained operation by carrying out exploration and development of the mineral deposits that surround the facility. Some delineated reserves available for mining exist but these reserves will not sustain an economic plant start-up. Ultimately, the Company may startup, redeploy, sell or joint-venture or otherwise monetize the Paciência processing facility. The Company has not established a timeframe to complete the Paciência remediation plans and restart production as it intends to focus on optimizing production and costs at the Turmalina and Caeté operations.

### 2. Sabará

During 2011 and 2012, Sabará remained on care-and-maintenance. In 2013, the Sabará operation was shut down and remediation work began to restore the Sabará plant area and the open pit areas with revegetation. The Company continued to restore the Sabará plant area during 2016 and this work will continue until completion expected in the fiscal year 2017.

### 3. Pedra Branca Project

The Pedra Branca Project is located in the State of Ceará in northeastern Brazil and is currently comprised of 20 exploration licences, totaling 34,855 hectares covering a 38-kilometre section of a regional shear zone. Final exploration reports and a Preliminary Economic Analysis (“PEA”) have been delivered to DNPM for three of these licences. The concessions are located in and around municipal areas with good infrastructure. The mineralized structures are open along strike with potential for significant gold mineralization.

Further work on the Pedra Branca Project, has been delayed as the Company focuses its efforts on the Turmalina and Caeté operations. Consequently, the Company made only those expenditures required to maintain the claims and land tenure in good standing.

The Pedra Branca Project is 100% owned by Jaguar. Based on the acquisition agreement of the project entered into with Glencore Xstrata plc. (“Glencore”), Glencore holds rights to a Net Smelter Royalty of one percent (1%) on future gold production and rights of first refusal on any Base Metal Dominant Deposit (as defined in the amendment) discovered, which if exercised, would allow Glencore to hold 70% of equity in a newly formed legal entity to hold such rights upon payment of three hundred percent (300%) of the Company’s exploration expenditures incurred exclusively on the relevant Base Metal Dominant Area of the property.

## RISK FACTORS

### I. **Risks Relating to the Gold Industry**

***Gold prices are volatile and there can be no assurance that a profitable market for gold will exist.***

Gold prices are volatile and subject to changes resulting from a variety of factors including international economic and political trends, expectations of inflation, global and regional supply and demand and consumption patterns,

stock levels maintained by producers and others, currency exchange fluctuations, inflation rates, interest rates, hedging activities and increased production due to improved mining and production methods. While the price of gold has recently been strong, there can be no assurance that gold prices will remain at such levels or be such that Jaguar's properties can be mined at a profit.

***Mining is inherently risky and subject to conditions and events beyond Jaguar's control.***

Mining involves various types of risks and hazards, including:

- environmental hazards;
- unusual or unexpected geological operating conditions, such as rock bursts, structural cave-ins or slides;
- flooding, earthquakes and fires;
- labor disruptions;
- industrial accidents;
- unexpected mining dilution such as occurred at Turmalina in 2010;
- metallurgical and other processing problems; and
- metal losses and periodic interruptions due to inclement or hazardous weather conditions.

These risks could result in damage to, or destruction of, mineral properties, production facilities or other properties, personal injury or death, environmental damage, delays in mining, increased production costs, monetary losses and possible legal liability.

Jaguar may not be able to obtain insurance to cover these risks at affordable premiums or at all. Insurance against certain environmental risks, including potential liability for pollution or other hazards as a result of the disposal of waste products occurring from production, is not generally available to Jaguar or to other companies within the mining industry. Jaguar may suffer a material adverse effect on its business if it incurs losses related to any significant events that are not covered by its insurance policies.

***Calculation of Mineral Reserves and Mineral Resources and metal recovery is only an estimate, and there can be no assurance about the quantity and grade of minerals until mineral resources are actually mined.***

The calculation of mineral reserves, mineral resources and corresponding grades being mined or dedicated to future production are imprecise and depend on geological interpretation and statistical inferences or assumptions drawn from drilling and sampling analysis, which might prove to be unpredictable. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Until mineral reserves or mineral resources are actually mined and processed, the quantity of mineral reserves or mineral resources and grades must be considered as estimates only. Any material change in mineral reserves, mineral resources, grade or stripping ratio at Jaguar's properties may affect the economic viability of Jaguar's properties. In addition, there can be no assurance that metal recoveries in small-scale laboratory tests will be duplicated in larger scale tests under on-site conditions or during production.

The mineral reserve estimates contained in this Annual Information Form are based upon estimates or reports published by Jaguar's personnel and independent geologists, who use assumed future prices, cut-off grades and operating costs that may prove to be inaccurate. Such estimation is a subjective process, and the accuracy of any mineral reserve or mineral resource estimate depends on the quantity and quality of available data and on the assumptions made and judgments used in interpreting geological data. There are numerous uncertainties inherent in estimating mineral reserves and mineral resources and metal recovery, many of which are beyond Jaguar's control, and as a result, no assurance can be given as to the accuracy of such estimates or reports. Extended declines in the market price for gold may render portions of Jaguar's mineralization uneconomic and result in reduced reported mineral reserves. A material reduction in Jaguar's estimates of mineral reserves, or of Jaguar's ability to



extract this mineralization, could have a material adverse effect on Jaguar's financial condition and results of operations.

***Significant uncertainty exists related to inferred mineral resources.***

There is a risk that inferred mineral resources referred to in this Annual Information Form cannot be converted into measured or indicated mineral resources. Due to the uncertainty relating to inferred mineral resources, there is no assurance that inferred mineral resources will be upgraded to resources with sufficient geological and grade continuity to constitute measured and indicated resources as a result of continued exploration.

**II. Risks Relating to Jaguar's Business**

***Jaguar's operations involve exploration and development and there is no guarantee that any such activity will result in commercial production of mineral deposits.***

The proposed programs on the exploration properties in which Jaguar holds an interest are exploratory in nature and such properties do not host known bodies of commercial ore. Development of these mineral properties is contingent upon, among other things, obtaining satisfactory exploration results. Mineral exploration and development involves substantial expenses related to locating and establishing mineral reserves, developing metallurgical processes and constructing mining and processing facilities at a particular site. It also involves a high degree of risk, which even a combination of experience, knowledge and careful evaluation may not be able to adequately mitigate. Few properties which are explored are ultimately developed into producing mines, and there is no assurance that commercial quantities of ore will be discovered on any of Jaguar's exploration properties. There is also no assurance that, even if commercial quantities of ore are discovered, a mineral property will be brought into commercial production, or if brought into production, that it will be profitable. The discovery of mineral deposits is dependent upon a number of factors including the technical skill of the exploration personnel involved. The commercial viability of a mineral deposit is also dependent upon, among a number of other factors, its size, grade and proximity to infrastructure, current metal prices, and government regulations, including regulations relating to required permits, royalties, allowable production, importing and exporting of minerals and environmental protection. The exact effect of these factors cannot be accurately predicted, but any one of these factors or the combination of any of these factors may prevent Jaguar from receiving an adequate return on invested capital. In addition, depending on the type of mining operation involved, several years can elapse from the initial phase of drilling until commercial operations are commenced. Some ore reserves may become unprofitable to develop if there are unfavorable long-term market price fluctuations in gold, or if there are significant increases in operating or capital costs. Most of the above factors are beyond Jaguar's control, and it is difficult to ensure that the exploration or development programs proposed by Jaguar will result in a profitable commercial mining operation.

***The results of Jaguar's Gurupi feasibility study remain subject to many risks relating both to that project and mining operations generally.***

Jaguar's decision to develop a mineral property is typically based on the results of a feasibility study. Jaguar has completed feasibility study work which outlines Mineral Reserves for the Gurupi Project in accordance with NI 43-101. Feasibility studies estimate the anticipated project economic returns. These estimates are based on assumptions regarding, among other things:

- future gold prices;
- future foreign currency exchange rates;
- anticipated tonnages, grades and metallurgical characteristics of ore to be mined and processed;
- anticipated recovery rates of gold extracted from the ore; and
- anticipated capital expenditure and cash operating costs.

Actual cash operating costs, production and economic returns may differ significantly from those estimated by such studies. Operating costs and capital expenditure are driven to a significant extent by the costs of the commodity inputs, including the cost of fuel and chemical reagents consumed in mining activities. In addition, there are a number of uncertainties inherent in the development and construction of any new mine, including the timing and cost of the construction of mining and processing facilities (which can be considerable), the availability and cost of skilled labor, power, water and transportation facilities, and the availability and cost of appropriate smelting and refining arrangements, the ability to obtain necessary environmental and other governmental permits and the time to obtain such permits, and the availability of funds to finance construction and development activities.

These estimates used in Jaguar's feasibility studies depend upon the data available and the assumptions made at the time the relevant estimate is made. Ore reserve estimates are not precise calculations and depend on the interpretation of limited information on the location, shape and continuity of the occurrence and on the available sampling results. Further exploration and feasibility studies can result in new data becoming available that may change previous ore reserve estimates which will impact upon both the technical and economic viability of production from the relevant mining project. Changes in the forecast prices of commodities, exchange rates, production costs or recovery rates may change the economic status of mineral reserves resulting in revisions to previous ore reserve estimates. These revisions could impact depreciation and amortization rates, asset-carrying values provisions for closedown, restoration and environmental clean-up costs.

***Fluctuations in currency exchange rates may adversely affect Jaguar's financial position and results of operations.***

Fluctuations in currency exchange rates, particularly operating costs denominated in currencies other than U.S. dollars, may significantly impact Jaguar's financial position and results of operations. Jaguar generally sells its gold based on a U.S. dollar price, but a major portion of Jaguar's operating expenses are incurred in non-U.S. dollar currencies. In addition, the appreciation of the Brazilian Real against the U.S. dollar could further increase the dollar costs of gold production at Jaguar's mining operations in Brazil, which could materially and adversely affect Jaguar's earnings and financial condition.

***Competition for new mining properties may prevent Jaguar from acquiring interests in additional properties or mining operations.***

The gold mining industry is intensely competitive. Significant and increasing competition exists for gold and other mineral acquisition opportunities throughout the world. Some of the competitors are large, more established mining companies with substantial capabilities and greater financial resources, operational experience and technical capabilities than Jaguar. As a result of this competition, Jaguar may be unable to acquire rights to additional attractive mining properties on terms it considers acceptable. Increased competition could adversely affect Jaguar's ability to attract necessary capital funding or acquire an interest in additional operations that would yield mineral reserves or result in commercial mining operations.

***Jaguar relies on its management and key personnel, and there is no assurance that such persons will remain at Jaguar, or that it will be able to recruit skilled individuals.***

Jaguar relies heavily on its management. Jaguar does not maintain "key man" insurance. Recruiting and retaining qualified personnel is critical to Jaguar's success. The number of persons skilled in the acquisition, exploration and development of mining properties is limited and competition for the services of such persons is intense. In addition, as Jaguar's business activity grows, it may require additional key financial, administrative, technical and mining personnel. The failure to attract and/or retain such personnel to manage growth effectively could have a material adverse effect on Jaguar's business, prospects, financial condition and results of operations.

**Actual capital costs, operating costs, production and economic returns may differ significantly from those estimated by Jaguar and there can be no assurance that any future development activities will result in profitable mining operations.**

Capital and operating costs, production and economic returns, and other estimates contained in the feasibility studies for Jaguar's projects may differ significantly from those anticipated by Jaguar's current studies and estimates, and there can be no assurance that Jaguar's actual capital and operating costs will not be higher than currently anticipated. In addition, delays to construction schedules may negatively impact the net present value and internal rates of return of Jaguar's mineral properties as set forth in the applicable feasibility studies.

Jaguar's cash operating costs per ounce sold and all-in sustaining costs per ounce sold\* for the years ending December 31, 2016, 2015, and 2014 were as follows:

		2016	2015	2014
<b>Turmalina</b>	Cash operating costs per ounce sold	\$566	\$624	\$865
	All-in sustaining costs per ounce sold	\$787	\$890	\$1,072
<b>Pilar</b>	Cash operating costs per ounce sold	\$926	\$826	\$983
	All-in sustaining costs per ounce sold	\$1,286	\$916	\$1,297
<b>Roça Grande</b>	Cash operating costs per ounce sold	\$1,425	\$1,186	\$1,099
	All-in sustaining costs per ounce sold	\$1,648	\$1,250	\$1,209
<b>Consolidated</b>	Cash operating costs per ounce sold	\$719	\$755	\$980
	All-in sustaining costs per ounce sold	\$1,099	\$1,079	\$1,378

\* Cash operating costs per ounces sold and all-in sustaining costs per ounce sold are non-IFRS measures with no standard definition under IFRS. Refer to the non-IFRS financial performance measures section of the Company's MD&A.

**Increases in energy costs or the interruption of Jaguar's energy supply may adversely affect Jaguar's results of operations.**

Jaguar's operations are energy intensive and rely upon third parties for the supply of the energy resources consumed in its operations. The prices for and availability of energy resources may be subject to change or curtailment, respectively, due to, among other things, new laws or regulations, imposition of new taxes or tariffs, interruptions in production by suppliers, worldwide price levels and market conditions. In addition, in recent years, the price of oil has risen dramatically due to a variety of factors. Disruptions in supply or increases in costs of energy resources could have a material adverse impact on Jaguar's financial condition and the results of operations.

**There can be no assurance that the interests held by Jaguar in its properties are free from defects.**

Jaguar's properties may be subject to prior recorded and unrecorded agreements, transfers or claims, and title may be affected by, among other things, undetected defects. Title insurance is generally not available for mineral properties, and Jaguar's ability to ensure that it has obtained a secure claim to individual mining properties or mining concessions may be severely constrained. Jaguar has not conducted surveys of all of the claims in which it holds direct or indirect interests. A successful challenge to the precise area and location of these claims could result in Jaguar being unable to operate on its properties as permitted or being unable to enforce its rights with respect to its properties. No assurance can be given that Jaguar's rights will not be revoked or significantly altered to its detriment. There can also be no assurance that its rights will not be challenged or impugned by third parties.

**Jaguar is exposed to risks of changing political stability and government regulation in the country in which it operates.**

Jaguar holds mineral interests in Brazil that may be affected in varying degrees by political instability, government regulations relating to the mining industry and foreign investment therein, and the policies of other nations in

respect of Brazil. Any changes in regulations or shifts in political conditions are beyond Jaguar's control and may adversely affect its business. Jaguar's operations may be affected in varying degrees by government regulations, including those with respect to restrictions on production, price controls, export controls, income taxes, expropriation of property, employment, land use, water use, environmental legislation and mine safety. The regulatory environment is in a state of continuing change, and new laws, regulations and requirements may be retroactive in their effect and implementation. Jaguar's operations may also be adversely affected in varying degrees by political and economic instability, economic or other sanctions imposed by other nations, terrorism, military repression, crime, extreme fluctuations in currency exchange rates and high inflation.

***Jaguar is subject to significant governmental regulations.***

Jaguar's mining and exploration activities are subject to extensive local laws and regulations. Failure to comply with applicable laws, regulations and permitting requirements may result in enforcement actions thereunder, including orders issued by regulatory or judicial authorities, who may require operations to cease or be curtailed, or corrective measures requiring capital expenditures, installation of additional equipment, or remedial actions. Parties engaged in mining operations may be required to compensate those suffering loss or damage by reason of the mining activities and may have civil or criminal fines or penalties imposed for violations of applicable laws or regulations.

Amendments to current laws, regulations and permits governing operations and activities of mining companies, or more stringent implementation of such requirements, could have a material adverse impact on Jaguar and cause increases in capital expenditures or production costs or reductions in levels of production at producing properties or require abandonment or delays in development of new mining properties.

***Jaguar's operations are subject to numerous governmental permits, which are difficult to obtain, and it may not be able to obtain or renew all of the permits it requires, or such permits may not be timely obtained or renewed.***

Government approvals and permits are sometimes required in connection with Jaguar's operations. Although Jaguar believes it has all of the material approvals and permits to carry on its operations, Jaguar may require additional approvals or permits or may be required to renew existing approvals or permits from time to time. Obtaining or renewing approvals or permits can be a complex and time-consuming process. There can be no assurance that Jaguar will be able to obtain or renew the necessary approvals and permits on acceptable terms, in a timely manner, or at all. To the extent such approvals are required and not obtained, Jaguar may be delayed or prohibited from proceeding with planned exploration, development or mining of mineral properties.

Under current regulations, all exploration activities that the Company undertakes through its subsidiaries must be carried out on valid exploration licenses or prospecting permits issued by the DNPM, a department of the Brazilian federal government. The DNPM is responsible for the administration of all mining and exploration licenses, and prospecting permits. According to local regulations, the Company must submit a final exploration report before the expiry date of any license or permit, which is usually three years from the date of grant. However, Brazilian mining laws and regulations are currently undergoing a major restructuring, and draft legislation to this effect has been submitted to the federal legislature for review and approval. The effects of this restructuring will, if adopted, be far-reaching in the ways that mining rights can be acquired and maintained in the country.

Current proposals include an auction process for new licenses, minimum expenditures designed to eliminate the "warehousing" of mining permits and licenses as well as new fee schedules. They also provide for land owner participation where applicable. It is the Company's understanding, based on consultations with local counsel, that licenses currently held in good standing will be grandfathered and not subject to certain requirements of the proposed new regime. Production from the Company's mines results in a 1% royalty fee payment to the Brazilian government (the "CFEM"), on the value of the ore produced. However, and as mentioned above, the Brazilian government is currently considering the adoption of new mining legislation which would include increases in the CFEM royalties.

Environmental permits are granted for one to two year periods and all local agencies have the right to monitor and evaluate compliance with the issued permits even though such monitoring tends to be minimal in scope and nature. Any changes to the exploration activities that result in a greater environmental impact require approval.

The work the Company carries out on its exploration licenses is largely restricted to drilling and ancillary activities associated with the drilling programs (i.e., low impact road construction, drilling stations). As such, the reclamation costs in respect of drilling activities are not material to the Company and are factored into the budget for exploration programs.

***Jaguar is subject to substantial environmental laws and regulations that may increase its costs and restrict its operations.***

All phases of Jaguar's operations are subject to environmental regulations in the jurisdictions in which it operates. These laws address emissions into the air, discharges into water, management of waste and hazardous substances, protection of natural resources and reclamation of lands disturbed by mining operations. Environmental legislation is evolving in a manner that will require stricter standards and enforcement, increased fines and penalties for non-compliance, more stringent environmental assessments of proposed projects and a heightened degree of responsibility for companies and their officers, directors and employees. Compliance with environmental laws and regulations may require significant capital outlays and may cause material changes or delays in, or the cancellation of, Jaguar's intended activities. There can be no assurance that future changes in environmental regulation, if any, will not be materially adverse to Jaguar's operations.

The properties in which Jaguar holds interests may contain environmental hazards, which are presently unknown to it and which have been caused by previous or existing owners or operators of the properties. If Jaguar's properties do contain such hazards, this could lead to Jaguar being unable to use the properties or may cause Jaguar to incur costs to clean up such hazards. In addition, Jaguar could become subject to litigation should such hazards result in injury to any persons.

***Land reclamation requirements for Jaguar's mining and exploration properties may be burdensome.***

Land reclamation requirements are generally imposed on companies engaged in mining operations and mineral exploration activities in order to minimize long-term effects of land disturbance. Reclamation may include requirements to control dispersion of potentially deleterious effluents and reasonably re-establish pre-disturbance land forms and vegetation. In order to carry out reclamation obligations imposed on Jaguar in connection with its mining and exploration activities, Jaguar must allocate financial resources that might otherwise be spent on further exploration and development programs. If Jaguar is required to carry out unanticipated reclamation work, its financial position could be adversely affected.

***Jaguar is subject to restrictive debt covenants.***

The Sprott Credit Agreement contains certain restrictions which limit Jaguar's ability to incur additional indebtedness. These restrictions may limit Jaguar's ability to take advantage of business opportunities as they arise. More importantly, Jaguar's ability to comply with the covenants may be affected by changes in economic or business conditions or other events beyond its control. A breach of these covenants by Jaguar and a corresponding default under the Sprott Credit Agreement in circumstances may result in the aggregate amount of the principal and interest on the Sprott Credit Facility becoming due and payable by Jaguar. Jaguar's ability to make accelerated payments will be dependent upon its cash resources at the time, its ability to generate sufficient revenue and its access to alternative sources of funds. The Sprott Credit Facility is secured by all of the material assets of Jaguar and any inability to pay the accelerated amount owing on the Sprott Credit Facility in full would allow Sprott to take control of and liquidate Jaguar's assets for the purpose of satisfying its obligations. Accordingly, Jaguar's inability to comply with the debt covenants could have a materially adverse effect on Jaguar's financial condition.

***Jaguar may need additional capital to accomplish its exploration and development plans or to cover its expenses, and there can be no assurance that financing will be available on terms acceptable to Jaguar, or at all.***

Depending on gold prices and Jaguar's ability to achieve its plans and generate sufficient operating cash flow from its existing operations, Jaguar may require substantial additional financing to accomplish its exploration and development plans as outlined or to fund any non-operating expenses that may arise or become due such as interest, tax (in Canada or Brazil) or other expenses. Failure to obtain sufficient financing, or financing on terms acceptable to Jaguar, may result in a delay or indefinite postponement of exploration, development or production on any or all of Jaguar's properties or even a loss of an interest in a property, or even a loss of an interest in a property, or an inability to pay any of Jaguar's non-operating expenses which could also lead to late fees or penalties, depending on the nature of the expense. The only source of funds now available to Jaguar is through production at Turmalina and Caeté, the sale of debt or equity capital, properties, royalty interests or the entering into of joint ventures or other strategic alliances in which the funding sources could become entitled to an interest in Jaguar's properties or projects. Additional financing may not be available when needed. If funding is available, the terms of such financing might not be favourable to Jaguar and might involve substantial dilution to existing shareholders. If financing involves the issuance of debt, the terms of the agreement governing such debt could impose restrictions on Jaguar's operation of its business. Failure to raise capital when needed could have a material adverse effect on Jaguar's business, financial condition and results of operations.

***Jaguar is exposed to risks of labor disruptions and changing labor and employment regulations.***

Employees of Jaguar's principal projects are unionized, and the collective bargaining agreements between Jaguar and the unions which represent these employees must be renegotiated on an annual basis. Although Jaguar believes it has good relations with its employees and with their unions, production at Jaguar's mining operations is dependent upon the continuous efforts of Jaguar's employees. In addition, relations between Jaguar and its employees may be affected by changes in the scheme of labor relations that may be introduced by the relevant governmental authorities in whose jurisdictions Jaguar carries on business. Labor disruptions or any changes in labor or employment legislation or in the relationship between Jaguar and its employees may have a material adverse effect on Jaguar's business, results of operations and financial condition. Labour litigation in Brazil is an ongoing exposure for all companies working in Brazil, especially in the mining sector. Jaguar has a number of labour claims and the settlement of such claims may result in significant cash outflow in future.

***Substantially all of Jaguar's assets are held by foreign subsidiaries that are subject to the laws of the Federal Republic of Brazil.***

Jaguar conducts operations through its wholly-owned foreign subsidiaries, MSOL, MTL and MCT and substantially all of Jaguar's assets are held through such entities. Accordingly, any governmental limitation on the transfer of cash or other assets between Jaguar, MSOL, MTL and MCT could restrict Jaguar's ability to fund its operations efficiently. Any such limitations or the perception that such limitations may exist now or in the future could have an adverse impact on Jaguar's prospects, financial condition and results of operations.

***Jaguar may be subject to litigation.***

All industries, including the mining industry, are subject to legal claims, with and without merit. Generally, the labour claims are due to disputed overtime, danger pay, wage parity, etc. The Company may become involved in legal disputes in the future. Defense and settlement costs can be substantial, even with respect to claims that have no merit. Due to the inherent uncertainty of the litigation process, there can be no assurance that the resolution of any particular legal proceeding will not have a material effect on the Company's financial position or results of operations.

Brazilian labour law is a complex system of statutes and regulations, which in general has a favourable approach to employees of the Company. As such, corporate labour compliance is a key success factor in Brazilian-based

operations to minimize the impact of labour claims. The Company has historically not been in full compliance of labour regulations nor did it have the proper procedures in place to support labour claims defences, which led to the bulk of the litigation provisions recorded.

In March 2013, management retained external counsel to review the Company's labour practices in Brazil to determine areas of improvement. As a result, management received a report which identified 48 labour law violations in the Company's legacy human resource practices capable of generating financial liability. Management has been tracking these 48 violations and has since implemented changes in procedures to eliminate those issues going forward and made significant progress during the last three years in addressing the deficiencies. The Company's human resource and legal departments have been continually reviewing the Company's practices and establishing action plans to improve labour practices and both departments continue to monitor the implementation of actions to remediate the legacy deficiencies.

***Jaguar may be subject to community relations and social licence to operate issues, or involvement from Non-Governmental Organizations (NGOs).***

Jaguar mines in a periurban environment adjacent to communities surrounded by lands used for agriculture, residence, and other industry. Jaguar has no significant community relations issues at present. However, ore from the Pilar mine is trucked to the Caeté site for processing which passes through one or two towns depending on the route. Jaguar has maintained good community relations with the neighbouring communities and city councils to date. Relations between Jaguar and its local communities may be affected by elections changing the relevant governmental authorities in whose jurisdictions Jaguar carries on business, by local community dissatisfaction with our operations, or by involvement of a NGO opposed to mining. Community disruptions, changes in the relationship between Jaguar and the communities wherein it operates, or new involvement by NGOs opposed to mining, may have a material adverse effect on Jaguar's business, which could result in changes in operational and financial conditions. Social licence to operate in Brazil is an ongoing exposure for all companies working in Brazil, especially in the mining sector.

***Jaguar may be subject to impacts on production if the road route between the Pilar mine and the Caeté site can not be used due to rain or other events.***

Jaguar has material properties located in the state of Minas Gerais, Brazil. Typically, the state's wet season is from November to April. During the wet season, the properties and surrounding infrastructure may be subject to unpredictable weather conditions such as heavy rains, strong winds, and flash flooding. The Pilar mine is located approximately 50 kilometres by road from the Caeté plant. Ore from the Pilar mine is hauled to the Caeté plant. Ore haulage activities may be slowed or delayed as roads may be temporarily flooded or if the maintenance or provision of such infrastructure is impacted by other events. Any delays could adversely affect Jaguar's operations, financial condition, and results of operations. Jaguar has undertaken to mitigate the potential effects of the wet season by discussing alternative routes with the neighbouring communities.

***Jaguar has no record of paying dividends.***

Jaguar has paid no dividends on its common shares since incorporation and does not anticipate doing so in the foreseeable future. Payment of any future dividends will be at the discretion of the Board after taking into account many factors, including operating results, financial condition, capital requirements, business opportunities and restrictions contained in any financing agreements.

***Global financial conditions may negatively impact its operations and share pricing.***

Current global financial conditions have been characterized by increased volatility, particularly the markets for commodities, including gold. Access to public financing has been negatively impacted by several factors including efforts by financial institutions to de-lever their balance sheets in the face of current economic conditions. These

factors may impact the ability of Jaguar to obtain equity or debt financing in the future on terms favorable to Jaguar. Additionally, these factors, as well as other related factors, may cause decreases in asset values that are deemed to be other than temporary, which may result in impairment losses. If Jaguar had to idle any of its producing properties or delay development of any project, there is no assurance that it would be able to restart production or development without undue delay, if at all. If such increased levels of volatility and market turmoil continue, Jaguar's operations could be adversely impacted and the trading price of its common shares may be adversely affected.

***The trading price for Jaguar's common shares is volatile and has been, and may continue to be, greatly affected by the ongoing market volatility.***

Securities of mineral exploration and early stage base metal production companies have experienced substantial volatility in the past, often based on factors unrelated to the financial performance or prospects of the companies involved. These factors include macroeconomic developments in North America and globally and market perceptions of the attractiveness of particular industries. Jaguar's common share price is also likely to be significantly affected by short-term changes in gold prices or in its financial condition or results of operations as reflected in its quarterly earnings reports. Other factors unrelated to Jaguar's performance that may have an effect on the price of its common shares include the following: the extent of analytical coverage available to investors concerning Jaguar's business may be limited if investment banks with research capabilities do not continue to follow Jaguar's securities; the lessening in trading volume and general market interest in Jaguar's securities may affect an investor's ability to trade significant numbers of Jaguar's common shares; and the size of Jaguar's public float may limit the ability of some institutions to invest in Jaguar's securities. As a result of any of these factors, the market price of Jaguar's common shares at any given point in time may not accurately reflect Jaguar's long-term value.

#### **DIVIDENDS**

Jaguar has not paid any dividends and does not intend to pay dividends in the foreseeable future. Any future payment of dividends will be dependent upon the financial requirements of Jaguar to fund future projects, the financial condition of Jaguar and other factors that the Board, in its discretion, may consider appropriate under the circumstances.

#### **DESCRIPTION OF CAPITAL STRUCTURE**

Jaguar is authorized to issue an unlimited number of common shares of which there were 307,115,675 issued and outstanding as of December 31, 2016. Holders of Jaguar's common shares are entitled to receive notice of any meetings of shareholders, to attend and to cast one vote per common share at all such meetings. Holders of Jaguar's common shares do not have cumulative voting rights with respect to the election of directors, and holders of a majority of Jaguar's common shares entitled to vote in any election of directors may therefore elect all directors standing for election. Holders of Jaguar's common shares are entitled to receive on a pro-rata basis such dividends, if any, as and when declared by the Board at its discretion from funds legally available therefore and upon the liquidation, dissolution or winding up of Jaguar are entitled to receive on a pro-rata basis the net assets of Jaguar after payment of debts and other liabilities, in each case subject to the rights, privileges, restrictions and conditions attaching to any other series or class of shares ranking senior in priority to or on a pro-rata basis with the holders of common shares with respect to dividends or liquidation. Jaguar's common shares do not carry any pre-emptive, subscription, redemption or conversion rights, nor do they contain any sinking or purchase fund provisions.

#### **MARKET FOR SECURITIES**

Jaguar's common shares were listed on the TSX-V until the common shares were listed on the TSX commencing August 3, 2016 under the symbol "JAG". See *"General Development of the Business – Recent History – New York*



*Stock Exchange Delisting, Toronto Stock Exchange Delisting, Listing on the Toronto Stock Venture Exchange, Termination of Registration with the SEC and Graduation to the Toronto Stock Exchange”.*

Jaguar’s Debentures were listed on the TSX under the symbol “JAG.DB.U”. As at November 7, 2016, 100% of the principal amount of the \$21.5 million Debentures were converted into common shares of the Company. For a full description of the Debentures, please see “*General Development of the Business – Recent History – Convertible Senior Secured Debenture Offering*”.

The following tables sets forth information relating to the trading of Jaguar’s common shares on the TSX-V and TSX for the periods indicated. The trading prices and volume data were obtained from infoventuresx.com.

#### **TSX-V Common Shares Trading**

	<b>High</b>	<b>Low</b>	<b>Volume</b>
January, 2016	0.195	0.150	587,755
February, 2016	0.220	0.150	2,322,190
March, 2016	0.320	0.180	29,993,469
April, 2016	0.395	0.310	9,787,005
May, 2016	0.380	0.320	4,075,628
June, 2016	0.500	0.335	19,785,969
July 2016	0.740	0.520	6,372,753

#### **TSX Common Shares Trading**

	<b>High</b>	<b>Low</b>	<b>Volume</b>
August, 2016	0.810	0.670	22,263,111
September 2016	0.790	0.680	4,315,599
October, 2016	0.750	0.640	16,275,155
November, 2016	0.760	0.580	14,050,373
December, 2016	0.620	0.550	3,502,814

#### **PRIOR SALES**

The Company has not issued any common shares or securities convertible into common shares during the year ended December 31, 2016 other than:

- 21,500 Debentures issued on October 27, 2015 at a price of \$1,000 per Debenture, for aggregate proceeds of \$21.5 million. In the third quarter and fourth quarter of 2016, all the Debenture holders voluntarily converted their Debentures into 188,795,215 common shares of the Company.
- 650,000 common shares of the Company were issued to Sprott Lending and to Natural Resource Income Investing Limited Partnership in consideration for and providing the financing commitment in relation to the Sprott Facility.
- 3,534,422 common shares of the Company were issued upon the exercise of warrants.
- 1,696,874 deferred share units (“DSUs”) were granted pursuant to the DSU Plan as an inducement to directors and executives of the Company.
- 3,000,000 deferred share units were redeemed into 3,000,000 common shares of the Company by an executive pursuant to the DSU Plan.
- 354,726 stock options were granted under Jaguar’s stock option plan, each with an exercise price of C\$0.74 and expiry date of August 8, 2021.

- 645,274 stock options were granted under Jaguar’s stock option plan, each with an exercise price of C\$0.76 and expiry date of November 7, 2021.

## DIRECTORS AND EXECUTIVE OFFICERS

### Directors and Executive Officers

On December 16, 2015, Mr. George Bee resigned as Chief Executive Officer of the Company and as a member of the Board, and Mr. Rodney Lamond was appointed as Chief Executive Officer. On February 19, 2016, Mr. Derrick Weyrauch resigned as Chief Financial Officer of the Company and Mr. Hashim Ahmed was appointed as Interim Chief Financial Officer. On June 24, 2016, the Board appointed Mr. Hashim Ahmed as Chief Financial Officer.

The following is a list of the directors and executive officers of Jaguar (collectively, the “Directors and Officers”), and information regarding each individual including municipality of home address, position with Jaguar, date of appointment to the position with Jaguar and their principal occupation during the past five years. As of December 31, 2016, the directors of Jaguar were Rodney Lamond, Richard D. Falconer, Luis Ricardo Miraglia, Edward V. Reeser, Robert Getz, John Ellis, and Thomas Weng. All directors hold office until the next annual meeting of shareholders or until their successors are elected or until their earlier death, resignation or removal.

Name & Municipality of Residence	Position and Date of Appointment	Principal Occupation (past five years)	Number of Common Shares Beneficially Owned	Percentage of Common Shares Beneficially Owned	Number of Deferred Share Units
<b>Rodney Lamond</b> British Columbia, Canada	Director October 29, 2015 Officer December 16, 2015	President and CEO of Jaguar Mining Inc. Board member, Gran Columbia Gold Corp. President and CEO of Crocodile Gold (2013-2015). Group General Manager and General Manager with Nyrstar NV (2009-2013).	1,787,000	0.58%	278,380
<b>Richard D. Falconer</b> Ontario, Canada	Director May 22, 2012 Chairman June 29, 2012	Managing Director of Lazard Canada Inc. since 2016. Senior Partner of Verus Partners & Co. Inc. (2014-2016). Vice Chairman and Managing Director of CIBC World Markets Inc. (1990-2011).	311,121	0.10%	421,372
<b>Luis Ricardo Miraglia</b> Minas Gerais, Brazil	Director September 27, 2012	Partner of Azevedo Sette Advogados, a Brazilian law firm, since 2004.	-	0.00%	421,372
<b>Edward V. Reeser</b> Ontario, Canada	Director June 10, 2013	President of Celco Inc. since 2001.	7,759	0.00%	421,372
<b>Thomas Weng</b> New Jersey, United States	Director April 1, 2016	Co-founder of Alta Capital Partners.	-	0.00%	233,145

Name & Municipality of Residence	Position and Date of Appointment	Principal Occupation (past five years)	Number of Common Shares Beneficially Owned	Percentage of Common Shares Beneficially Owned	Number of Deferred Share Units
<b>Robert Getz</b> Connecticut, United States	Director June 24, 2016	Managing Director and Partner at Cornerstone Equity Investors.	572,500	0.19%	203,472
<b>John Ellis</b> Nevada, United States	Director June 24, 2016	Director for International Tower Mines and for Sunshine Silver Mines Corporation.	-	0.00%	203,472
<b>Hashim Ahmed</b> Ontario, Canada	Officer February 19, 2016	Chief Financial Officer, Jaguar Mining Inc. Financial Controller, Projects – Barrick Gold (2008-2014).	29,000	0.01%	259,080

As at March 30, 2017, the directors and executive officers of the Company, as a group, beneficially owned, directly or indirectly, or exercised control over, a total of 2,707,380 common shares, representing 0.88% of the issued and outstanding common shares of the Company, as well as a total of 2,441,665 deferred share units. The deferred share units are exercisable upon the retirement of non-executive directors, and upon vesting for executive officers.

On December 15, 2016, the Company revised its Board Committee structures. The new Committees and members are as follows:

**Corporate Governance and Nomination Committee:**

- Luis Miraglia (Chairman)
- Edward Reeser
- Robert Getz
- John Ellis

**Finance & Corporate Development Committee:**

- Thomas Weng (Chairman)
- Robert Getz
- Edward Reeser
- Luis Miraglia

**Audit & Risk Committee:**

- Edward Reeser (Chairman)
- Thomas Weng
- Robert Getz

**Compensation Committee**

- Robert Getz (Chairman)
- Luis Miraglia
- Thomas Weng
- John Ellis

### **Safety, Environmental, Technical and Reserves Committee**

- John Ellis (Chairman)
- Luis Miraglia
- Edward Reeser

For information on Jaguar's Audit and Risk Committee, see the section below entitled "*Audit Committee*".

### **Corporate Cease Trade Orders or Bankruptcies**

Except as stated below, no director or executive officer of Jaguar, or shareholder holding a sufficient number of securities of Jaguar to affect materially the control of Jaguar, is, as at the date of this Annual Information Form, or has been within ten (10) years before the date of this Annual Information Form, a director or executive officer of any company that, while that person was acting in that capacity:

- i. was the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under securities legislation, for a period of more than thirty (30) consecutive days except as set forth in the second and third to last paragraphs of this section;
- ii. was subject to an event that resulted, after the director or executive officer ceased to be a director or executive officer, in the company being the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under securities legislation, for a period of more than thirty (30) consecutive days; or
- iii. within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets.

Further, except as noted below, no director, executive officer, promoter or other member of management of Jaguar has within the ten years before the date of this Annual Information Form, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of the Nominee.

Except for Mr. Lamond, Mr. Ahmed, Mr. Getz, Mr. Ellis, and Mr. Weng, each of the Directors and Officers listed above was a director or officer respectively, when Jaguar commenced the CCAA Proceedings. See "*General Development of the Business – Recent History – CCAA Proceeding*".

### **Audit and Risk Committee and Audit Fees**

#### ***Audit and Risk Committee Charter***

The text of the Audit and Risk Committee is attached as Appendix "A" to this Annual Information Form.

#### ***Composition of the Audit and Risk Committee***

As at the date of this Annual Information Form, the members of the Audit and Risk Committee were Messrs. Reeser (chair), Getz and Weng. All three members are independent and financially literate within the meaning of National Instrument 52-110. The relevant education and experience of each Audit and Risk Committee member is as follows:

Edward V. Reeser is the President of Celco Inc. (Food Service Equipment), one of Canada's major commercial food service equipment importers and distributors. Mr. Reeser served as a director and member of the Finance and Audit

Committee of Bridgepoint Health from September 2011 to December 2014 and was the Chair of the Audit Committee of Temex Resources Corp. from 2014 to 2015. Mr. Reeser has over 15 years' experience as a senior financial officer of TSX-listed companies in the metallurgical, aviation and energy utility industries. Mr. Reeser holds a Master of Business Administration degree (finance concentration) from York University, a Bachelor of Arts from York University and an ICD.D designation from the Institute of Corporate Directors.

Robert Getz currently serves as a Director of Haynes International, Inc., a developer and producer of specialty nickel alloys. Mr. Getz previously served as Chairman of the Board of Crocodile Gold Corp., a gold exploration and mining company with operations in Australia, prior to the company's successful merger with Newmarket Gold in July 2015. Mr. Getz subsequently served as a Director of Newmarket Gold Inc. until May 2016. Mr. Getz holds a Bachelor of Arts, cum laude, from Boston University, and a Master of Business Administration in Finance from the Stern School at New York University.

Thomas Weng is currently Co-Founding Partner with Alta Capital Partners, a provider of financial advisory services (since February 2011). From February 2007 to January 2011, Mr. Weng was a Managing Director at Deutsche Bank and Head of Equity Capital Markets for Metals and Mining throughout the Americas and Latin America, across all industry segments. Prior to 2007, Mr. Weng held various senior positions at Pacific Partners, an alternative investment firm, and Morgan Stanley and Bear Stearns. Mr. Weng graduated from Boston University with a Bachelor of Arts in Economics.

#### ***Audit Fees***

During the fiscal years ended December 31, 2016 and December 31, 2015, KPMG LLP, Chartered Professional Accountants ("KPMG"), charged Jaguar a total of C\$501,206 and C\$527,500 respectively, for audit services.

#### ***Audit-Related Fees***

During the fiscal years ended December 31, 2016 and December 31, 2015, KPMG charged C\$nil and C\$nil respectively, for assurance and related services that are reasonably related to the performance of audit-related services but are not reported above in "Audit Fees".

#### ***Tax Fees***

During the fiscal years ended December 31, 2016 and December 31, 2015, KPMG billed C\$43,117 and C\$29,911 respectively, for tax compliance, tax advice and tax planning services.

#### ***All Other Fees***

In each of the fiscal years ended December 31, 2016 and December 31, 2015, KPMG billed C\$nil and C\$nil respectively, for services other than those reported under "Audit Fees", "Audit-Related Fees", and "Tax Fees".

### **INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS**

To the knowledge of the management of Jaguar, none of the directors, executive officers or principal shareholders of Jaguar and no associate or affiliate of the foregoing persons has or has had any material interest, direct or indirect, in any transaction within the past three years or in any proposed transaction that has materially affected or will materially affect Jaguar or any of its subsidiaries, except for:

- Sprott Lending is an indirectly wholly-owned subsidiary of Sprott Inc., of which the Chairman is Mr. Eric Sprott. Mr. Sprott is a shareholder of the Company and held approximately 19% of the common shares of the Company at the time Jaguar entered into the Sprott Credit Agreement on November 7, 2016. Sprott Lending extended credit to the Company in the amount of \$10,000,000 (the "Sprott Facility") on November 8, 2016. The Sprott Facility is payable over a term of 30 months, in equal monthly repayments, and bears interest at a rate of 6.5% per annum, plus the greater of US dollar LIBOR or 1.25% per annum. In consideration for the structuring and syndication of the Sprott Facility, the Company made a cash payment to Sprott Lending for structuring and legal fees in the amount of \$200,000 and the Company issued 650,000

common shares of the Company to Sprott Lending and to Natural Resource Income Investing Limited Partnership in consideration for and providing the financing commitment. In accordance with the terms of the Sprott Facility, the Company made principal repayments and interest payments of \$667,000 and \$117,000, respectively, during the year ended December 31, 2016 (2015 – \$nil and \$nil; 2014 – \$nil and \$nil). For a full description of the Sprott Facility, see “*General Development of the Business – Recent History – Credit Agreement with Sprott Private Resource Lending (Collector) LP*”;

- Consulting expenses paid to Hermann Consulting Inc. (“Hermann”), a company owned by Fred Hermann, a former director of Jaguar. Fees paid to Hermann amounted to approximately \$nil for the year ended December 31, 2016 (2015 – \$nil, 2014 – \$83,000);
- The Company incurred legal fees from Azevedo Sette Advogados (“ASA”), a law firm where Luis Miraglia, a director of Jaguar is a partner. Fees paid to ASA are recorded at the exchange amount – being the amount agreed to by the parties and included in general and administration expenses in the statements of operations and comprehensive loss – and amount to \$128,000 for the year ended December 31, 2016 (2015 – \$87,000; 2014 – \$51,000).
- The Company also incurred legal fees from Goodmans LLP (“Goodmans”), a law firm where Robert Chadwick, a former director of Jaguar is a partner. Fees paid to Goodmans are recorded at the exchange amount - being the amount agreed to by the parties and included in general and administration expenses in the statements of operations and comprehensive loss – and amount to \$nil for the year ended December 31, 2016 (2015 – \$11,000; 2014 – \$113,000).

#### **TRANSFER AGENT AND REGISTRAR**

In February 2017, the Company changed its transfer agent and registrar for its Common Shares from Computershare Investor Services Inc. to TSX Trust Services, Toronto, Ontario.

#### **MATERIAL CONTRACTS**

Other than contracts entered into in the ordinary course of business, the only material contracts that Jaguar has entered into the most recently completed financial year, or prior thereto and are still in effect, are as follows:

- The Trust Indenture dated October 27, 2015 between Jaguar, Computershare Trust Company of Canada, Mineração Serras Do Oeste LTDA., Mineração Turmalina LTDA and MCT Mineração LTDA providing for the issuance of \$21,500,000 principal amount of 12% Convertible Senior Secured Debentures maturing October 27, 2018. This agreement ended in the fourth quarter of 2016 subsequent to the conversion of 100% of the Senior Secured Debentures to common shares of the Company.
- Credit Agreement with Sprott Private Resource Lending (Collector) LP for \$10 million secured loan facility signed on November 7, 2016. See “*General Development of the Business – Overview of Business*”.

#### **INTERESTS OF EXPERTS**

##### External Auditors

KPMG LLP, Chartered Professional Accountants are Jaguar’s auditors, and have advised the Company that they are independent of the Company within the meaning of the relevant rules and related interpretations prescribed by the professional bodies in Canada and any applicable legislation or regulations.

### Qualified Persons

Turmalina - "Technical Report on the Turmalina Mine, Minas Gerais State, Brazil", filed on SEDAR on May 24, 2016, (the "Turmalina Technical Report"). The Turmalina Technical Report was prepared by Jason Cox, P. Eng. and Reno Pressacco, P. Geo, both from RPA, each of whom is a "qualified person" as that term is defined in NI 43-101 and have verified the data.

Caeté - "Technical Report on the Roca Grande and Pilar Operations", filed on SEDAR on April 18, 2016 (with an effective date of April 18, 2016), (the Caeté Technical Report") was prepared by Jason Cox, P. Eng. and Reno Pressacco, P. Geo, both from RPA, each of whom is a "qualified person" as that term is defined in NI 43-101 and have verified the data.

Gurupi - In respect of the scientific and technical information contained in this AIF relating to the Company's Gurupi Project, (i) information up to January 31, 2011 is derived from the technical report titled "*Gurupi Gold Project Cipoeiro e Chega Tudo Properties Feasibility Study*", filed on SEDAR on January 31, 2011 (with an effective date of January 31, 2011), (the "Gurupi Feasibility Study"). The Gurupi Feasibility Study was prepared by Ivan C. Machado, MSc. P.E., P.Eng. of TechnoMine; (ii) information on updated Measured & Indicated Resources dated July 30, 2012 for the Gurupi Project was prepared by or under the supervision of Leah Mach from SRK. Gurupi Mineral Reserves and Mineral Resources 2016 estimated were reviewed, approved, and verified by Geraldo Santos, BSc Geo., MAIG (CP), who is a "qualified person" as that term is defined in NI 43-101.

Jason Cox, Reno Pressacco, Ivan Machado and Leah Mach do not own, directly or indirectly, any securities of Jaguar or have any direct or indirect interest in any property of Jaguar or of any associate or affiliate of Jaguar. Mr. Santos is an employee of Jaguar and does not own securities of Jaguar or have any direct or indirect interest in any property of Jaguar or any associate or affiliate of Jaguar.

### **ADDITIONAL INFORMATION**

Additional information relating to Jaguar may be found on SEDAR at [www.sedar.com](http://www.sedar.com).

Additional information, including directors' and officers' remuneration and indebtedness, principal holders of Jaguar's securities, and securities authorized for issuance under equity compensation plans is contained in Jaguar's information circular for its most recent annual meeting of shareholders. Additional financial information is provided in Jaguar's audited consolidated financial statements and management's discussion and analysis for its financial year ended December 31, 2016.

**APPENDIX A**



**JAGUAR MINING INC.**

**CHARTER OF THE AUDIT AND RISK COMMITTEE**

**A. History of the Charter**

Adopted by the Board: May 12, 2005  
Amended by the Board March 20, 2017

**Purpose of the Committee**

The Audit and Risk Committee (the "Committee") is appointed by the Board of Directors (the "Board") of Jaguar Mining Inc. (the "Company") to assist the Board in fulfilling its oversight responsibilities relating to financial accounting and reporting process and internal controls for the Company, including the preparation of any report required by The Ontario Securities Commission or other similar bodies in Canada or other countries.

The primary purpose of the Committee with respect to its audit mandate is to assist Board oversight of: (i) the integrity of the Company's financial statements, (ii) the qualifications and independence of the Company's external auditor (the "Independent Auditor") and the Internal Auditor (iii) the performance of both the Company's internal audit function and the Independent Auditor.

The primary purpose of the Committee with respect to its risk mandate is to assist the Board in fulfilling its oversight responsibilities related to the risks to which the Company is exposed and its enterprise risk management approach to managing and insuring against those risks.

The Committee is also the primary working committee of the Board with respect to overseeing matters related to compliance with ethical and anti-corruption legislation.

**A. Duties**

The Committee's primary duties and responsibilities are to serve as an independent and objective committee of the Company's Board, with responsibility for the completion of the general tasks set out in this section and the specific tasks set out in Section F. In addition, the Committee shall report to the Board with such recommendations and other matters as the Committee deems appropriate so that the Board is informed of the Committee's activities.

1. Conduct such reviews and discussions with management and the independent auditors relating to the audit and financial reporting as are deemed appropriate by the Committee;
2. Assess the integrity of internal controls and financial reporting procedures of the Company and ensure implementation of such controls and procedures;
3. Review the quarterly and annual financial statements, management's discussion and analysis of the Company's financial position and operating results, and all press releases and website postings pertaining to financial matters prior to their being filed with the appropriate regulatory authorities or posted on the Company's website and report thereon to the Board;



4. Recommend the selection of the Company's external auditors and monitor the independence and performance of the Company's external auditors (the "Independent Auditors") and internal auditors, including attending private meetings with both and reviewing and approving prior to recommendation to the Board all renewals or dismissals and the remuneration of both;
5. Set clear policies regarding the hiring of employees or former employees (including partners) of the present and former Independent Auditors by the Company;
6. Monitor the quality and integrity of the Company's financial statements and other financial information; and
7. Provide oversight to related party transactions entered into by the Company.
8. Oversee the operation of the Company's whistleblower program to ensure timely and effective compliance with legal requirements and high ethical standards.
9. Oversee the Company's compliance with the Foreign Corrupt Practices Act and similar legislation in all countries relevant to the Company
10. Oversee the Company's information technology programs to ensure data integrity, sound financial control processes and security measures to protect the Company's data and information.
11. Oversee the Company's enterprise risk management and insurance programs.

#### **B. General Authority**

1. The Committee shall have the resources and authority it deems necessary and appropriate to discharge its responsibilities at the Company's expense, including authority to select and retain legal or other consultants or experts, to approve the fees and other retention terms related to the appointment of such consultants or experts, and to terminate the services of any such consultants or experts with respect to any matters including compensation.
2. The Committee shall have the power to call upon assistance from officers and employees of the Company and outside counsel and other advisers, including the Independent and Internal Auditors.
3. The Committee, and each member of the Committee in his or her capacity as such, shall be entitled to rely, in good faith, on information, opinions, reports or statements, or other information prepared or presented to them by officers and employees of the Company, whom such member believes to be reliable and competent in the matters presented and on counsel or other persons as to matters which the member believes to be within the professional competence of such person.
4. Except as limited by law, or applicable securities rules and regulations, the Committee may form and delegate authority to such individuals or subcommittees as it deems appropriate.
5. The Committee has the authority to conduct any investigation appropriate to its responsibilities.
6. The Committee shall be given unrestricted access to the books and records of the Company.
7. The Committee may fulfill additional duties and adopt additional policies and procedures as may be appropriate in light of changing business, legislative, regulatory or other conditions. The Committee shall keep the Board apprised of any additional duties it intends to fulfill.

8. The Committee shall have the power to adopt its own operating rules and procedures, without the consent of management.

9. The Committee shall perform any other activities consistent with this Charter and governing law, as the Committee or the Board deems necessary or appropriate.

### **C. Composition and Meetings**

#### *I. Composition of Committee*

1. The Committee shall be composed of three or more directors of the Company as shall be designated by the Board from time to time. The Board shall appoint a member who shall serve as Chair of the Committee.

2. Each member of the Committee shall be “independent” and “financially literate” (as such terms are defined in Multilateral Instrument 52-110 of the CSA) and meet any eligibility criteria mandated by applicable corporate or securities law, or the rules of any applicable stock exchange.

3. Members of the Committee and the Chair shall receive such remuneration for their service on the Committee as the Board may determine from time to time (which remuneration may include cash and/or shares or options or other in-kind consideration ordinarily available to directors).

#### *II. Committee Meetings*

1. The Committee shall meet at least once each quarter, at the discretion of the Chair or a majority of its members, as circumstances dictate or as may be required by applicable legal or listing requirements.

2. A minimum of two and at least 50% of the members of the Committee present either in person or by telephone shall constitute a quorum.

3. If and whenever a vacancy shall exist that is not filled by an appointment by the Board, the remaining members of the Committee may exercise all of its powers and responsibilities so long as a quorum remains in office.

4. The time and place of the Committee meetings shall be determined from time to time by the Committee. A meeting of the Committee may be called by letter, telephone, facsimile, email or other communication equipment by giving at least 48 hours notice, provided that no notice of a meeting shall be necessary if all of the members are present either in person or by means of teleconference or if those absent have waived notice or otherwise signified their consent to the holding of such meeting. The independent auditor will be provided notice of all meetings of the Committee and will generally attend unless the subject matter is such that attendance is not required or desirable.

5. The Chair will chair all meetings of the committee and set the agendas for committee meetings.

6. The Committee shall keep minutes of its meetings which shall be submitted to the Board. The Committee may, from time to time, appoint any person who need not be a member to act as a secretary at any meeting.

7. The Committee may invite such officers, directors and employees of the Company and its subsidiaries or any other person as it may see fit to attend at meetings of the Committee.

8. Any matters to be determined by the Committee shall be decided by a majority of votes cast at a meeting of the Committee called for such purpose. Actions of the Committee may be taken by an instrument or instruments in writing signed by all of the members of the Committee, and such actions shall be effective as though they had

been decided by a majority of votes cast at a meeting of the Committee called for such purpose. All decisions or recommendations of the Audit Committee shall require the approval of the Board prior to implementation by the Company, except for any recommendation or approval that is specifically delegated by the Board.

9. The Committee will prepare an annual work plan to guide its activities and shall review the work plan with the Board.

#### **D. Responsibilities**

##### *1. Financial Accounting and Reporting and Internal Controls*

1. The Committee shall review the Company's annual audited financial statements to satisfy itself that they are presented in accordance with applicable accounting principles and report thereon to the Board and recommend to the Board whether or not same should be approved prior to their being filed with the appropriate regulatory authorities. The Committee shall also review and approve the Company's quarterly financial statements and management discussion and analysis prior to their being filed with the appropriate regulatory authorities and report thereon to the Board. With respect to financial statements and related materials, the Committee shall discuss significant issues regarding accounting principles, practices, and judgments of management with management and the Independent Auditors as and when the Committee deems it appropriate to do so.

2. The Committee shall review all press releases pertaining to financial matters to ensure conformity with the Company's financial statements and timely disclosure obligations.

The Committee shall satisfy itself that the information contained in the annual audited and quarterly financial statements is not erroneous or misleading in a material manner and that the audit and/or review function has been effectively carried out.

3. The Committee shall review annual and quarterly management's discussion and analysis and annual and quarterly financial statements and any other public disclosure documents that are required to be reviewed by the Committee under any applicable laws prior to their public disclosure or being filed with the appropriate regulatory authorities including, without limitation, any press releases announcing annual or quarterly earnings.

4. The Committee shall review management's internal control reports and the evaluation of such reports by the Independent Auditors, together with management's responses.

5. The Committee shall meet no less frequently than annually with the Independent Auditors and the Chief Financial Officer to review accounting practices, internal controls and such other matters as the Committee deems appropriate.

6. The Committee shall inquire of management and the Independent Auditors about significant risks or exposures, both internal and external, to which the Company may be subject, and assess the steps management has taken to minimize such risks.

7. The Committee shall review, during an in-camera meeting, the post-audit or management letter containing the recommendations of the Independent Auditors and management's response and subsequent follow-up to any identified weaknesses.

8. The Committee shall provide oversight to related party transactions entered into by the Company.

9. The Committee shall satisfy itself that adequate procedures are in place for the review of the Company's public disclosure of financial information derived or extracted from the Company's financial statements and periodically assess the adequacy of those procedures.

10. The Committee shall provide oversight of the Company's programs for hedging gold prices and currencies.

*II. Independent Auditors*

1. The Committee shall be responsible for recommending to the Board the selection, appointment, renewal, dismissal, compensation and oversight of the Independent Auditors, and the Independent Auditors shall report directly to the Committee.
2. The Committee shall directly monitor and assess the relationship between management and the Independent Auditors and monitor, confirm, support and ensure the independence and objectivity of the Independent Auditors. The Committee shall be responsible for resolving disagreements between management and the Independent Auditors. The Committee shall establish procedures to receive and respond to complaints with respect to accounting, internal accounting controls and auditing matters.
3. The Committee shall pre-approve all audit and non-audit services not prohibited by law to be provided by the Independent Auditors to the Company or its subsidiaries. This can be completed by the Chairman of the Committee, provided the Committee receives a report at the next meeting. The Committee shall not allow fees for non-audit services provided by the Independent Auditors to exceed \$25,000 for a specific project or \$50,000 in aggregate during a given year without express approval of the Board.
4. The Committee shall review the Independent Auditor's audit plan, including scope, procedures and timing of the audit.
5. The Committee shall review, during an in camera meeting, the results of the annual audit with the Independent Auditors, including matters related to the conduct of the audit.
6. The Committee shall obtain timely reports from the Independent Auditors describing critical accounting policies and practices, alternative treatments of information within applicable accounting standards that were discussed with management, their ramifications, and the Independent Auditors' preferred treatment and material written communications between the Company and the Independent Auditors.
7. The Committee shall review fees paid by the Company to the Independent Auditors and other professionals in respect of audit and non-audit services on an annual basis.

*III. Internal Auditors*

1. The Committee shall be directly responsible for the selection, appointment, renewal, dismissal, compensation and oversight of the Company's Internal Auditor(s), and the Internal Auditor will report directly to the Committee (through the Chairman) on all functional matters. The Internal Auditor shall report to the CEO with respect to operational matters and the Chairman of the Committee and the CEO will work together to ensure an appropriate balance between the independence of the Internal Auditor and conformity with the Company's overall procedures and processes.
2. The Committee will review annually the Internal Audit Charter and recommend any proposed changes to Management.
3. The Committee shall review and approve the annual internal audit plan prepared by the company's internal audit group, including scope, procedures and timing of activities.
4. The Committee shall at each Audit and Risk Committee Meeting receive a report from the Company's internal auditors based on the results of their internal audit activities.

5. The Committee shall at each Audit and Risk Committee Meeting discuss during an in camera meeting the results of the internal audit activities with the Company's internal auditors, including matters related to the undertaking of the internal audits. In addition the Committee will periodically review with the internal auditors any significant difficulties, disagreements with management, or scope restrictions encountered in the course of their work.

#### *IV. Whistleblower Policy*

1. The Committee shall oversee the procedures for the receipt, retention and treatment of complaints including confidential or anonymous employee complaints with respect to accounting, internal accounting controls and auditing matters.

2. The Company will promptly forward to the Chairman of the Committee any complaints that it has received regarding financial statement disclosures, accounting, internal accounting controls or auditing matters. The Chairman shall keep the members of the Committee apprised of the progress of each investigation on a regular basis.

3. Any employee of the Company or any of its subsidiaries may submit, on a confidential and anonymous basis if the employee so desires, any concerns regarding financial statement disclosures, accounting, internal accounting controls or auditing matters. All such concerns will be set forth in writing and forwarded in a sealed envelope addressed to the attention of the chairman of the Audit Committee, c/o the Company's Toronto address set forth at the Company's website, in an envelope labeled with a legend such as: "To be opened by the Audit Committee only. Submitted pursuant to the Jaguar Mining Inc. Whistleblower Policy." If an employee would like to discuss any matter with the Committee, the employee should indicate this in the submission and include a telephone number at which he or she can be reached, should the Committee deem such communication is appropriate. Alternatively, concerns can be communicated by phone to Ethics Point, an independent service partner, at

1-888-279-5268 for US and Canada, 0-800-891-1667 for Brazil or

[www.jaguarmining.com/s/corporategovernance/whistleblower](http://www.jaguarmining.com/s/corporategovernance/whistleblower).

4. Following the receipt of any complaints submitted, the Chairman shall initiate an investigation. Following the investigation the Company shall take such corrective and disciplinary actions as it considers appropriate, and such action shall be discussed with the Chairman of the Committee. The Chairman shall report to the full Committee on a regular basis regarding investigation results and corrective action.

5. The Committee may enlist employees of the Company and/or outside legal, accounting or other advisor to conduct any investigation of complaints regarding financial statement disclosures, accounting, accounting controls or auditing matters. In conducting any investigation, the Committee shall use reasonable efforts to protect the confidentiality and anonymity of the complainant.

6. It is the policy of the Company that employees will not be discharged, demoted, suspended, threatened, harassed or in any other manner discriminated against as a result of any complaint made hereunder in good faith.

7. The Company shall make this policy available to all employees.

8. The Committee will retain as a part of its records any such complaints or concerns for a period of at least seven (7) years.

#### **G. Review of Charter and Self-Assessment**

1. The Committee should review and reassess the adequacy of this Charter no less than every two years.
2. The Committee shall review annually the Committee's own performance.
3. The Committee should review no less than every two years the Whistleblower Policy.

#### **H. Other Responsibilities**

The Committee shall perform any other activities consistent with this Charter and governing law, as the Committee or the Board deems necessary or appropriate.

The Board may at any time amend or rescind any of the provisions hereof, or cancel them entirely, with or without substitution.